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DEPARTMENT OF AGRICULTURE.

BULLETIN No. 145.

COMMERCIAL FEEDING STUFFS

IN

PENNSYLVANIA,

IN

1905.

BY

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Chemist.



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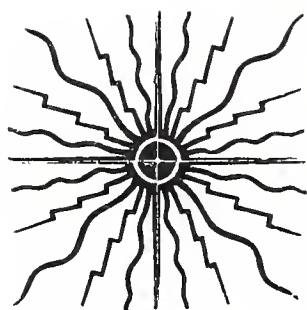
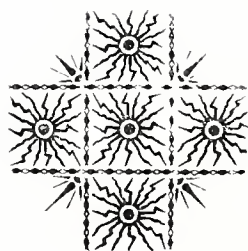


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PREFACE.

Department of Agriculture,
Harrisburg, Pa., April 6, 1906.

Few legislative enactments, that have in recent years gone upon the statute books of our Commonwealth in the interest of farmers, are of more real value than the act of April 25, 1901, known as "The Feeding Stuffs Law."

There are still to be found in Pennsylvania a number of farmers who are engaged in raising grain, especially corn and oats, for sale, to whom the law affords protection against the cheap feed mixtures that are brought into this State from other sections of our country. In the great grain-growing states lying west of us, cereals that are raised in Pennsylvania almost exclusively for feeding purposes, are sold to manufacturers of Glucose, Starch, Hominy, Breakfast Foods, etc. Some of the by-products obtained from the manufacture of these articles are quite valuable for feeding purposes, while others, such as corn cobs and oat hulls, possess very little value. Unfortunately, there are some manufacturers who are not as much concerned as they should be to place upon the market only such articles as will yield to the consumers a fair return for their cost, and so we find many feed compounds that are being sold in our State at prices largely in excess of their true value, while they are made to imitate in appearance better grades of feed so closely that it is difficult to distinguish between them. The Pennsylvania farmer, therefore, who has feed to sell profits by the protection the Feeding Stuffs Law affords.

We have in Pennsylvania another class of farmers that are benefited still more than those who raise feed to sell. In sections of the State where dairying is the leading farm industry, great quantities of western cereal feeds are bought and fed upon the farms, and every one who knows how much the profits derived from the dairy depend upon the character of the feed supply can realize how important it is to the dairyman, who goes into the market to purchase his concentrated feeds, to have some means by which he may be able to determine, at least their approximate value, and know whether he is getting a fair return for his outlay of cash.

The many citizens of our State engaged in occupations other than farming, in which the use of horses and mules is necessary, are interested in the legal regulation of feed supplies as much as farmers are, and so this Department feels that it is not necessary to offer any excuse or apology for what a few persons have been disposed to consider excessive zeal in the enforcement of the Feeding Stuffs Law. It was the hope of the present administration that by giving publicity to the requirements of the law, as well as to the defects

found in feeds of certain character, compliance with the law might be secured; but after having fully tested the effect of giving the greatest publicity possible to the provisions of the law itself, as well as to the many failures of manufacturers and dealers to comply with its requirements, the conclusion reached was that nothing short of a rigid enforcement of the law would secure the desired end.

Up to the time of the present writing, the fines paid into the State Treasury resulting from prosecutions for violations of the law, amount to \$2,791.10, and the same active policy will be continued until every citizen of Pennsylvania, who is under the necessity of buying concentrated feed, can make his purchases feeling sure that he knows just what he is getting.

The publication of this Annual Bulletin is one of the results of the Feeding Stuffs Law, and this number has been prepared with very great care. The chemist has, by special request, given tables of information which, if studied, will be found quite helpful to buyers. Every one accustomed to feeding animals has some knowledge, obtained from practice, of the feeding value of certain whole grains and certain grain combinations. For example, some feeders of horses prefer whole oats to any other grain feed. Others prefer an equal mixture in weight of oats and corn, while a third class choose to add to the mixture some wheat bran. Anyone knowing from experience the results he has secured with any given feed, can, by going to these tables, see just what per cent. of nutrient matter it contains, and then, when he goes to the feed store and finds the analysis upon every package of feed that is there for sale, if he is accustomed to making simple arithmetical calculations, he can, with the lead pencil that every farmer's institute lecturer insists that he must carry with him, figure out what he wants to buy.

A large edition of this bulletin will be printed because of the importance of the information it contains and the desire that a copy shall, if possible, go into the hands of every person in the State who has any considerable number of animals to feed. The purpose of the chemist, who has had a large experience in Feeding Stuffs Control work, has been to make it as practical as possible, and it is hoped that the information it contains may serve to increase the profits of all who will carefully study its contents.

N. B. CRITCHFIELD,
Secretary of Agriculture.

LETTER OF TRANSMITTAL.

Pennsylvania Department of Agriculture,
Feeding Stuffs Control.

Harrisburg, April 5, 1906.

Hon. N. B. Critchfield,

Secretary of Agriculture, Harrisburg, Pa.:

Dear Sir: I have the honor to present herewith a bulletin, entitled "Commercial Feeding Stuffs in Pennsylvania, in 1905." This bulletin contains the results obtained in the examination of feeding stuffs during the year 1905, together with such additional information as circumstances advise.

Very respectfully,

F. D. FULLER,
Chemist.



COMMERCIAL FEEDING STUFFS

IN

PENNSYLVANIA,

IN

1905.

By F. D. FULLER.

SUMMARY.

During the year 1905, forty-one towns and cities in twenty-four counties of the Commonwealth were visited by a Special Agent of the Department of Agriculture, and three hundred and forty samples of feeding stuffs were taken. Three hundred and thirty-nine samples of feed represented by two hundred and forty-eight brands, were analyzed. Sixty-three per cent. of the number analyzed required the guarantees for protein and fat, and fifty-eight per cent. of those which required the guarantees failed to meet the requisitions. One hundred and twelve samples of wheat offals were examined and only four guaranteed according to law. Twenty-two guaranteed samples were deficient in protein and fat, eleven were low in fat and thirteen fell short in protein. One hundred and twenty-seven prosecutions have been brought in nineteen counties, as a result of violations of the acts of the Assembly.

Six samples were found to be adulterated—wheat bran with rice hulls, wheat bran with corn cob, "chop" (corn and light oats) with coffee hulls, two samples of corn and oats chop and one sample of corn, oats and barley with oat hulls.

Wheat offals were inferior in quality which was due largely to climatic conditions.

The oat feeds on the market contain a large proportion of oat hulls.

There are on the market, however, a large variety of feeding stuffs of good quality from which the farmer should have no difficulty in choosing those best adapted to his need.

As long as the farmer can raise plenty of corn, hay and oats, he can not afford to purchase any feeding stuff containing less than 14 per cent. of protein.

The consumer should be on the alert in order to be sure that he is getting full return for the money expended. He should carefully examine the materials and refuse to purchase any feed which is musty, wormy, inferior or seems adulterated. The State Feeding Stuffs Law requires that practically all feeds must be guaranteed, as far as their protein and fat contents are concerned, and the consumer should purchase only guaranteed goods, provided the guarantees correspond to the analysis of standard articles.

INTRODUCTION.

The State of Pennsylvania is to be congratulated upon having passed laws protecting its people from many kinds of fraudulent practices. One of the laws now in operation, is known as the Pure Food Law, which has for its end that what is designed for consumption by the human family shall be pure and free from material which would render it unwholesome.

A similar law, which is now operating in this State, is of great benefit to farmers, and dairymen in particular, and is known as the Commercial Feeding Stuffs Law.

An act of the General Assembly was approved by the Governor on April 25, 1901, and not only prohibits the adulteration of food for domestic animals, but requires that the sale of practically all feeds, with few exceptions, must be accompanied by a printed statement certifying the number of net pounds in the package (if not sold from bulk), the brand name, the name and address of manufacturer or jobber and also a statement of the percentage it contains of crude fat and crude protein.

Attention is called to the fact that the law as amended April 24, 1905, extended the definition of the term "Concentrated Commercial Feeding Stuffs" so as to include the brans and middlings of wheat, rye and buckwheat, although persons engaged, within the State of Pennsylvania, in the business of manufacturing flours, may sell, at the place where made, their own make of bran and middlings, without complying with the provisions of Section 1, Act No. 78, Laws of 1901.

The acts of the General Assembly which relate to the sale and analysis of feeding stuffs are reproduced in full for the benefit of interested parties.

No. 78.

AN ACT

Regulating the sale of concentrated commercial feeding stuffs, defining concentrated feeding stuffs, prohibiting their adulteration, providing for the collection of samples, the expenses of the enforcement of the law, and fixing penalties for its violation.

Section 1. Be it enacted, &c., That every lot or parcel of any concentrated commercial feeding stuff, as defined in section two of this act, used for feeding domestic animals, sold, offered or exposed for sale within this State, shall have affixed thereto, in a conspicuous place on the outside thereof, a legible and plainly printed statement clearly and truly certifying the number of net pounds of feeding stuff contained therein; the name, brand or trade mark under which the article is sold; the name and address of the manufacturer or importer, and a statement of the percentage it contains of crude fat and of crude protein, both constituents to be determined by the methods adopted at the time by the Association of Official Agricultural Chemists of the United States. Whenever any concentrated commercial feeding stuff is sold at retail, in bulk, or in sacks belonging to the purchaser, the agent or dealer, upon request of the purchaser, shall furnish to him the certified statement named in this section.

Statement certifying weight of material, the name or trade mark, etc.

When statement is to be furnished the purchaser.

Section 2. The term "concentrated commercial feeding stuffs," as used in this act, shall include linseed meals, cotton seed meals, gluten meals, maize feeds, starch feeds, sugar feeds, dried brewers' grains, malt sprouts, hominy foods, cerealine feeds, rice meals, ground beef or fish scraps, and all other materials of similar nature, but shall not include hays and straws, the grinding together of pure whole grains, nor the unmixed meals made directly from the entire grains of wheat, rye, barley, oats, Indian corn, buckwheat, or broom corn; neither shall it include wheat, rye or buckwheat bran, or middlings not mixed with other substances, and sold separately as distinct articles of commerce.

"Concentrated commercial feeding stuffs" defined.

Section 3. No foreign mineral substance, nor substance injurious to the health of domestic animals, shall be mixed with any feeding stuff sold, or offered or exposed for sale in this State.

Injurious substances shall not be used.

Section 4. Each and every manufacturer, importer, agent or seller of any concentrated feeding stuff shall, upon request, file in the office of the Secretary of Agriculture a certified copy of the statement named in section one of this act.

Filing of certified statement.

Section 5. Each and every manufacturer, importer, agent or person, selling, offering or exposing for sale

Penalty for omission of statement.

Proviso.

Powers and duties of Secretary of Agriculture and his agents.

The taking and labeling of samples.

Retention of samples.

Payment of necessary expenses.

Proviso.

Application of penalties and costs.

in this State any concentrated commercial feeding stuff, as defined in section two of this act, without the statement required by section one of this act; or affixing a statement or guarantee which is false in any particular or in relation to which the provisions of all of the foregoing sections have not been fully complied with, shall, for every such offense, forfeit and pay the sum of one hundred dollars, which shall be recoverable with costs, including the expenses of analysis, by any person suing in the name of the Commonwealth, as debts of like amount are by law recoverable: Provided, That the Secretary of Agriculture shall, together with his deputies, agents and assistants, be charged with the enforcement of this act, and shall have full access to all places of business, mills, buildings, carriages, cars, vessels and packages, of whatsoever kind, used in the manufacture, importation or sale of any concentrated commercial feeding stuff; and shall also have power and authority to open any package containing or supposed to contain any concentrated commercial feeding stuff, and take therefrom samples for analysis, upon tendering the value of said sample; and whenever requested, said samples shall be taken in the presence of the party or parties interested or their representative, shall be thoroughly mixed and then divided into two samples and put in glass vessels and carefully sealed, and a label placed upon each vessel stating the name or brand of the feeding stuff or material sampled, the name of the manufacturer when possible, the name of the party from whose stock the sample was taken, and the time and the place of taking, said labels to be signed by the Secretary of Agriculture or his agent, and by the party or parties interested or their representative, if present, at the taking of the samples. One of said duplicate samples shall be retained by the Secretary of Agriculture or his agent, and the other by the party whose stock was sampled.

Section 6. All necessary expenses under the provisions of this act shall, after approval in writing by the Governor and the Secretary of Agriculture, be paid by the State Treasurer upon the warrant of the Auditor General, in the manner now provided by law: Provided, That not more than five thousand dollars shall be expended in any one year, and all penalties and costs for the violation of the provisions of this act shall be paid to the said Secretary of Agriculture or his agent, and by him immediately covered into the State Treasury, to be kept as a separate fund, for the use of the Department in carrying out the provisions of this act, and to be drawn out upon warrants signed by the Secretary of Agriculture and the Auditor General.

Section 7. Every person who violates any of the provisions of this act shall also be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than fifty dollars nor more than one hundred dollars, or by imprisonment in the county jail for not less than ten nor more than thirty days, or both fine and imprisonment for the first offense, and a fine of one hundred dollars and imprisonment for every subsequent offense: Provided, That all fines and costs, including the expense of analysis, imposed and recovered under this section shall be covered into the State Treasury, as provided by section six of this act.

Violation of act a misdemeanor.

Fine and penalty.

Proviso.

Section 8. Magistrates and justices of the peace throughout this Commonwealth shall have jurisdiction to hear and determine actions arising from violation of the provisions of this act, and to hold for court or impose the penalties prescribed therein, subject to appeal as the law shall direct.

Jurisdiction of magistrates.

Section 9. This act shall take effect on the first day of October, one thousand nine hundred and one.

Act to take effect.

Section 10. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

Repeal.

Approved—The 25th day of April, A. D., 1901.

WILLIAM A. STONE.

The foregoing is a true and correct copy of the act of the General Assembly No. 78.

W. W. GRIEST,
Secretary of the Commonwealth.

No. 212.

AN ACT

To amend the second section of an act, entitled "An act regulating the sale of concentrated commercial feeding stuffs, defining concentrated feeding stuffs, prohibiting their adulteration, providing for the collection of samples, the expenses of the enforcement of the law, and fixing penalties for its violation," approved the twenty-fifth day of April, Anno Domini one thousand nine hundred and one, so as to extend the application of the term commercial feeding stuffs.

Section 1. Be it enacted, &c., That section two of an act regulating the sale of concentrated commercial feeding stuffs, prohibiting their adulteration, providing for the collection of samples, the expenses of the enforcement of the law, and fixing penalties for its violation, approved the twenty-fifth day of April, Anno Domini one thousand nine hundred and one, which reads as follows:

Section 2, act of
April 25, 1901,
cited for amend-
ment.

"Section 2. The term 'concentrated commercial feeding stuffs,' as used in this act, shall include linseed meals, cotton seed meals, gluten meals, maize feeds, starch feeds, sugar feeds, dried brewers' grains, malt sprouts, hominy foods, cerealine feeds, rice meals, ground-beef or fish-scrap, and all other materials of similar nature; but shall not include hays and straws, the grinding together of pure whole grains, nor the unmixed meals made directly from the entire grains of wheat, rye, barley, oats, Indian corn, buckwheat or broom-corn; neither shall it include wheat, rye or buckwheat bran, or middlings not mixed with other substances, and sold separately, as distinct articles of commerce," be and the same is hereby amended to read as follows:

Concentrated com-
mercial feeding
stuffs.

The term defined.

Section 2. The term "concentrated commercial feeding stuffs," as used in this act, shall include linseed meals, cotton seed meals, gluten meals, maize feeds, starch feeds, sugar feeds, dried brewers' grains, malt sprouts, hominy feeds, cerealine feeds, rice meals, corn bran; wheat, rye and buckwheat bran, and middlings, ground beef or fish-scrap, and all other materials of similar nature that are manufactured and sold as feeds for live stock and poultry; but shall not include hay, straw and corn stover, when the same is unmixed with other materials, or the unmixed meals made from wheat, rye, barley, oats, buckwheat, Indian corn or broom-corn: Provided, That nothing in this act shall be construed as prohibiting persons engaged, within the State of Pennsylvania, in the business of manufacturing flours, from selling, at the place where made, their own manufacture of bran and middlings, without complying with the provisions of section one of this act.

Proviso.

Flour manufac-
turers.

Approved—The 24th day of April, A. D., 1905.

SAML. W. PENNYPACKER.

The foregoing is a true and correct copy of the act of the General Assembly No. 212.

FRANK M. FULLER,
Secretary of the Commonwealth.

It is readily seen that the several requirements of the above acts put no interference in the way of legitimate trade, and the reputable manufacturer suffers no hardship in complying with their provisions.

Manufacturers or jobbers shipping goods into this State should properly brand and guarantee their articles as required by the Pennsylvania law for the protection of the dealers of the State who are responsible for the proper branding or tagging of feeds they offer for sale.

The Department of Agriculture is anxious to promote the best interests of all parties. It believes in mutual good will and honest co-operation.

This Bulletin presents the work of the Department in the examination of many commercial feeding stuffs found in the markets of Pennsylvania, during the year ending December 31, 1905, together with such additional information as circumstances advise.

SAMPLES OBTAINED BY A SPECIAL AGENT OF THE DEPARTMENT OF AGRICULTURE.

During the year 1905, Mr. Geo. G. Hutchison, Special Agent of the Department, visited forty-one towns and cities of Pennsylvania and took three hundred and thirty-nine samples of feeding stuffs, and sent them, under seal, to the writer. In addition to these, one sample was received directly from the Secretary of Agriculture, making a total of three hundred and forty samples examined.

These samples have been subjected to chemical and microscopical analysis and the results and comments on the same are found in the following pages.

One sample of corn and oats chop was moldy when received, and was not examined further.

TABLE I. COUNTIES VISITED AND NUMBER OF SAMPLES SECURED FROM EACH.

Name of County.	No. of samples.
Allegheny,	11
Blair,	59
Cambria,	37
Cameron,	8
Centre,	17
Chester,	19
Clearfield,	31
Clinton,	25
Columbia,	4
Dauphin,	6
Elk,	6
Erie,	14
Fayette,	14
Huntingdon,	5
Jefferson,	9
Lancaster,	12
McKean,	3
Mifflin,	1
Northumberland,	5
Philadelphia,	17
Somerset,	2
Warren,	7
Westmoreland,	14
York,	19
Total,	349

The samples analyzed may be classified as follows:

TABLE II. CLASSIFICATION OF SAMPLES ANALYZED.

Name of Feed.	No. samples.	No. brands.
Cottonseed meal,	1	1
Linseed meal, N. P.,	2	1
Linseed meal, O. P.,	10	8
Flaxseed meal,	3	3
Distillers' grains,	6	3
Brewers' grains,	1	1
Malt sprouts,	1	1
Gluten meal,	1	1
Gluten feed,	7	5
Corn bran,	1	1
Hominy feed,	1	1
Corn meal,	1	1
Corn feed meal,	1	1
Corn flour,	1	1
Red dog flour,	7	7
Wheat middlings,	49	46
Bran and middlings,	4	2
Wheat bran,	59	46
Oat feeds,	13	4
Mixed feeds, proprietary and otherwise,	164	108
Barley products,	4	4
Sugar beet residue,	2	2
Totals,	339	248

GUARANTEES.

Of the three hundred and thirty-nine samples analyzed, two hundred and fourteen, or sixty-three per cent. of the total, required the guarantees. Of the two hundred and fourteen samples which required the guarantees for protein and fat, one hundred and twenty-five, or fifty-eight per cent., failed to meet the requirements. One hundred and twelve samples of wheat offals (bran, middlings and bran and middlings, mixed) were examined and only four were sold in accordance with the requirements of the amendment of the act of the Assembly.

Many feeds which were guaranteed were deficient in protein, and a few did not contain the guaranteed amount of fat. Many reasons are advanced to explain why feeding stuffs do not hold up to their guarantees, such as the poor quality of the corn and wheat crops and the variability in the composition of the various cereals which enter largely into the make-up of mixed feeds, but the manufacturer, knowing that the season, climate, soil, etc., influence the composition of the raw products which he uses, should be particularly careful to always know the analysis of the finished product as it leaves his mill. Only in this way can he expect to guarantee his goods properly and therefore escape the inevitable result which follows a violation of the act.

Some dealers, who, evidently, lack confidence in their feeds, in order not to violate the law make what seems to be a reckless statement concerning the nutrient content of their feeds. There are feeds on the market which ordinarily should contain from 12 to 14 per cent. of protein and 3 per cent. of fat, but guaranteed to contain

not less than 5 per cent. of protein and not less than 1 per cent. of fat. It would be well for consumers to be careful how they purchase such materials.

The attention of manufacturers is respectfully called to the fact that *it is improper to guarantee the amount of protein and fat together*, as the act requires that the guarantees shall state the per cent. of crude protein and crude fat.

The following table shows the deficiency in protein and fat in cases where it exceeded ten per cent. of the guaranteed amount.

TABLE III. FEEDING STUFFS FALLING SHORT OF THEIR GUARANTEES MORE THAN TEN PER CENT.

Name of Feed.	Total No. of samples.	Deficient in protein.	Deficient in fat.	Deficient in protein and fat.
Cottonseed meal,	1	.....	1	.....
Distillers' grains,	2	1	.....	.....
Continental gluten feed,	2	2	.....	.....
Cream gluten meal,	1	.....	1	.....
Warner's gluten feed,	3	2	.....	.....
Buckeye wheat feed,	3	1	.....	2
Vim oat feed,	7	2	.....	1
Friend's oat feed,	12	.....	.....	2
Royal oat feed,	3	.....	.....	2
Quaker dairy feed,	4	2	.....	.....
Sucrene dairy feed,	3	.....	.....	1
Green diamond sugar feed,	1	.....	.....	.....
American poultry food,	1	1	.....	.....
Sucrene horse feed,	3	.....	.....	1
H-O horse feed,	7	.....	2	.....
Star feed,	2	.....	.....	1
Keystone chop,	4	.....	3	.....
Victor corn and oat feed,	6	1	.....	1
Boss corn and oat feed,	1	1	.....	.....
Dairy corn and oat chop,	1	.....	.....	1
Corn, oats and barley, (American Cereal Co.'s),	11	.....	1	6
Schunacher's stock feed,	6	.....	.....	3
Pure barley,	2	.....	1	.....
Dried beet pulp,	2	.....	2	.....
Totals,	78	13	11	22

From the above table it is readily seen that of forty-six deficient samples, thirteen fell short in protein, eleven in fat and twenty-two were deficient in both protein and fat.

It is gratifying to note that certain manufacturers are beginning to realize that their products are guaranteed too high. This is especially true of the gluten feeds and the guarantees on many other goods must be lowered to conform to actual analysis.

VIOLATIONS OF THE LAW.

One hundred and twenty-seven prosecutions have been brought in nineteen counties of the State, as a result of violations of the

acts in 1905. Up to the present time (March 28, 1906), nearly \$2,800 have been collected in fines and analysis fees and covered into the State Treasury to be used in carrying out the provisions of the Feeding Stuffs Law. Hearings in some of these cases are yet to be had, while other cases are to come up in court for trial.

ILLEGALLY SOLD WITHOUT GUARANTEES.

A majority of the violations of the acts involved wheat bran and wheat middlings which were sold without complying with the provisions of Section 1 of Act No. 78. In other words, these offals were illegally sold without the necessary guarantees.

It seems proper to state that the Department has been very lenient in regard to the illegal sale of the articles above mentioned, and, although the Amendment to the act, which made it necessary to furnish guarantees with the sale of these goods, was approved April 24, 1905, the Secretary of Agriculture ordered that no prosecutions should be brought which involved samples taken before August 1st. In the meantime due notice of the Amendment was given in the press and by means of circulars issued from the Department of Agriculture and sent to feed dealers in the State whose addresses could be obtained, but even then the excuse most often heard was an ignorance of the law.

It is also claimed that wheat offals are standard articles, free from adulteration and therefore need no guarantees. As a matter of fact, their composition is variable, adulteration is frequent, and in order to protect the consumer, it is necessary to guarantee their content of protein and fat.

We have met the statement many times, that the brans and middlings from wheat, rye, and buckwheat are "meals," and therefore are not included among feeds requiring guarantees. *The act does not require the "unmixed meals made from wheat, rye, barley, oats, buckwheat, Indian corn, or broom-corn" to be guaranteed*, but there seems to be a failure on the part of many to comprehend the *definition* of the term "meal," and as a matter of information, the following definitions* are given:

Grain is the fully matured, clean, sound, air-dry seed of wheat, maize, rice, oats, rye, buckwheat, barley, sorghum, millet, or spelt.

Meal is the sound product made by grinding grain.

Flour is the fine, sound product made by bolting wheat meal and contains not more than thirteen and one-half (13.5) per cent. of moisture, not less than one and twenty-five hundredths (1.25) per cent. of nitrogen, not more than one (1.0) per cent. of ash, and not more than fifty hundredths (0.50) per cent. of fiber.

Graham flour is unbolted wheat meal.

Maize meal, corn meal, or Indian corn meal is meal made from sound maize grain and contains not more than fourteen (14) per cent. of moisture, not less than one and twelve hundredths (1.12) per cent. of nitrogen and not more than one and six-tenths (1.6) per cent. of ash.

It is easily seen from the above definition of the term "meal," that *wheat meal is the sound product made by grinding wheat kernels*. Wheat bran and wheat middlings are offals obtained in

*Standards of Purity for Food Products, Cir. 13, Office of Sec., U. S. Dep't of Agriculture.

the manufacture of patent flour. *They consist of particular portions of the wheat kernel and not the entire kernel.*

In addition to wheat offals, a number of feeds, including linseed meal, brewers' grains, malt sprouts, gluten feed, hominy chop, corn feed meal, oat feeds, mixed feeds, etc., were sold without guarantees. Several adulterated feeds were also illegally sold.

ILLEGALLY SOLD WITH INCORRECT GUARANTEES.

As mentioned in the preceding pages, many feeds were deficient in protein and fat. In nearly all cases it seemed best to allow a deficiency of ten per cent., but where it was very evident that the guarantees were too high for the class of material under consideration, and exceeded the actual analysis by more than ten per cent. of the guaranteed amounts, prosecution was ordered. Attention is called, in Table VIII, to instances where feeds were illegally sold.

ADULTERATIONS.

Three samples of feeds analyzed showed adulterations of a flagrant nature.

One sample of *wheat bran* (No. S 1), was seriously *adulterated with rice hulls*. It also contained about ten per cent. of common salt.

Another sample of *wheat bran* (No. 335), *contained sufficient ground corn cob* to lower the protein and fat contents to 10.44 per cent. and 2.97 per cent. respectively, and increase the fiber to 16.76 per cent.

A sample of "*chop*" (No. 295), evidently taken from material sold as corn and oats chop, *contained coffee hulls*, otherwise known as "cornaline," material which resembles corn bran, but has distinguishing characteristics as shown under the microscope.

Coffee hulls have been used to adulterate wheat bran, but no report has ever come to the writer that they have been found in corn and oats chop. More will be said about these adulterants in the following pages.

Two samples of *corn and oats chop* (Nos. 82 and 259) and one sample of *corn, oats and barley* (No. 260), *contained an excess of oat hulls*. These adulterations merit severe judicial condemnation.

CLASSIFICATION OF FEEDING STUFFS.

Feeding stuffs can be conveniently arranged into classes according to their protein and carbohydrate contents.

The percentage of protein in feeding stuffs gradually decreases from cottonseed meal to oat feeds which are not much better than oat hulls.

The arrangement here presented is practically the one suggested by Jordan and Jenter* with a few of the more recent feeds added.

TABLE IV. FEEDING STUFFS ARRANGED IN CLASSES.

CLASS I—30 per cent. to 45 per cent. protein,.....	{	Cottonseed meal, linseed meal, Cream, Chicago and King gluten meals, Ajax Flakes, Biles XXXX and Merchants' distillers' grains.
50 per cent. to 60 per cent. carbohydrates,		
CLASS II—20 per cent. to 30 per cent. protein,	{	Gluten feeds, malt sprouts, dried brewers' grains, buckwheat middlings, peas and beans.
60 per cent. to 70 per cent. carbohydrates,		
CLASS III—14 per cent. to 20 per cent. protein,	{	Red dog flour, bran and middlings from wheat and rye, H-O, Sucrene, Hammond and Protana dairy feeds and Molasses grains.
70 per cent. to 75 per cent. carbohydrates,		
CLASS IV—8 per cent. to 14 per cent. protein,	{	Quaker dairy feed, barley, corn, oats, rye, wheat, cerealine, hominy, and oat feeds, corn and oats chop, corn bran, H-O and Sucrene horse feeds, American poultry food and dried beet pulp.
75 per cent. to 85 per cent. carbohydrates,		

The hays and other coarse fodders can be classed in the last group.

COMPOSITION OF FEEDING STUFFS.

Knowing the amounts of protein, fat and crude fiber in a feed, one can form some opinion as to its feeding value although its digestibility must be taken into consideration. An index of the nature of the feed is usually found in the percentages of nutrients present.

The following table presents figures showing the average percentages of protein, fat and crude fiber in the principal feeding stuffs found on the market. The partial composition of various mixtures is also given.

Most of the figures have been taken from Bul. 81, of this Department, which were in turn taken from Farmers' Bul. 22, Department of Agriculture, Washington, D. C.

Since the publication of the above bulletins, the composition of certain feeds has changed somewhat, therefore the following figures more nearly represent their analyses at the present time. The figures showing the partial composition of the various mixtures given in the latter part of the table, were obtained by calculation. The percentages given are averages, from which there are variations.

*Bul. 166, New York (Geneva) Experiment Station.

TABLE V. AVERAGE PARTIAL COMPOSITION OF FEEDING STUFFS.

Name of Feed.	Protein.	Fat.	Fiber.
	Per ct.	Per ct.	Per ct.
Cottonseed meal,	42.3	9.0	5.6
Linseed meal, N. P.,	38.2	3.0	9.5
Linseed meal, O. P.,	32.9	7.9	8.9
Ground linseed,	21.6	30.4	7.3
Distillers' dried grains,	32.0	13.0	11.8
Brewers' dried grains,	25.0	5.6	11.0
Malt sprouts,	23.2	1.7	10.7
Gluten meal,	29.7	3.0	2.2
Gluten feed,	24.0	3.5	5.3
Buckwheat middlings,	28.9	7.1	4.1
Wheat middlings,	17.4	5.6	5.2
Wheat bran,	15.4	4.0	9.0
Oats,	11.8	5.9	9.5
Wheat,	11.9	2.1	1.8
Barley,	12.4	1.8	2.7
Corn,	10.5	5.4	2.1
Rye,	10.6	1.7	1.7
Buckwheat,	10.0	2.2	8.7
Corn meal,	9.2	3.8	1.9
Oat meal,	14.7	7.1	0.9
Barley meal,	10.5	2.2	6.5
Hominy chop,	9.8	8.3	3.8
Corn and cob meal,	8.5	3.5	6.6
Corn cob,	2.4	0.5	30.1
Oat hulls,	3.4	1.3	37.2
Rice hulls,	3.6	0.7	35.7
Corn and oats, equal parts,	11.1	5.2	5.8
Corn, 75 per cent.; oats, 25 per cent.,	10.8	5.3	3.9
Corn, 25 per cent.; oats, 75 per cent.,	12.4	5.1	7.6
Oats and oat hulls, equal parts,	7.6	3.1	23.5
Oats, 75 per cent.; oat hulls, 25 per cent.,	10.7	4.0	16.5
Oats, 25 per cent.; oat hulls, 75 per cent.,	5.5	2.2	30.5
Corn, oats and barley, equal parts,	11.5	4.0	4.7
Corn, oats and rye, equal parts,	10.9	4.0	4.4
Oats and rye, equal parts,	11.2	3.3	5.6

In Table VIII are given the percentages of moisture, protein, fat and fiber found in each feed as determined by chemical analysis. In order to make it easier to understand the results, the following brief explanations are given:

Moisture, or water, is present in all feeding stuffs. The material may seem to be dry, but nevertheless it contains an appreciable amount of water which is determined by heating a known quantity of the food at the temperature of boiling water for several hours, and noting the loss in weight. Feeding stuffs should be compared on a moisture-free basis.

Protein is a term which includes all the nitrogenous compounds of a feed, regardless of their nature. They all contain nitrogen and this seems to be the only common characteristic. Protein is determined indirectly. Sixteen per cent. of the protein present is made up of nitrogen, so that by making a direct estimation of nitrogen and multiplying the result by the factor 6.25, we obtain the percentage of protein.

In every day life we deal with materials which resemble protein substances, namely, white of egg, curd of milk, lean meat, gelatin, etc., and the animal uses the protein of the food to make these important substances, to restore the waste of tissues and muscles, which occurs at all times, and also uses it to form flesh. Protein then is the most necessary ingredient for the farmer to purchase, and as it is the most important nutrient in commercial feeds, so is it the most expensive. These facts explain why the percentage of protein in feeding stuffs should be guaranteed.

Fat, or the ether extract, properly speaking, is made up of the substances which are extracted from the dry feeding stuff by absolute ether. It consists, chiefly, of the fats and oils, but the gums, waxes and coloring matters are also removed. Fat is guaranteed because a pound is worth 2.25 times as much as a pound of starch in producing heat and energy, because an excess of fat in the feed tends to retard digestion, and certain feeds containing over ten per cent. may become sour and unpalatable.

Fiber is usually the most indigestible portion of a feed. It is largely made up of cellulose, and cotton fiber is a familiar example. When the fiber is digested its value is probably equal to that of starch or sugar.

OF WHAT VALUE ARE THE ANALYSES OF FEEDING STUFFS?

A table showing the analyses of feeding stuffs is useful in several ways.

First, it immediately shows if any particular brand of feed or particular sample of that brand is of inferior or superior quality, as compared with others of the same class. *Secondly*, it shows whether or not the feed is up to the guarantees of protein and fat. *Thirdly*, if the material is adulterated, or not, it often shows it, and many times if it is adulterated, the table of analyses indicates the nature of the adulteration. *Fourthly*, it supplies data for the compounding of rations for farm animals, and in order to do this skillfully, one must make a study of the subject of feeding animals, the exposition of which can not be undertaken within the limited space furnished in a bulletin.

COEFFICIENTS OF DIGESTIBILITY.

Feeding stuffs are not entirely digested. A portion of each passes through the body without being absorbed and used by the animal. It is obvious, therefore, that of two feeds having nearly the same composition, the one which is most digestible has a greater nutritive value.

A certain amount of the protein, fat, fiber, etc., of each feed is digested by animals and the term "coefficients of digestibility" represents the percentages of nutrients retained in the process of digestion. These percentages vary with different feeds.

In Table VI will be found digestion coefficients of many of the feeds used at the present time.

For instance, the average digestion coefficient of protein in "Victor corn and oat feed" is 71, and in cottonseed meal, it is 88. That is, out of every 100 pounds of protein furnished by "Victor corn and

oat feed," 71 pounds are digestible by neat cattle, while out of the same amount of protein supplied by cottonseed meal, 88 pounds are utilized by the animal, provided, of course, that these feeds are of average quality and the animal is in good health.

To make an actual use of this table we will take the analysis of the sample of cottonseed meal, found on page 39, which is as follows: Protein, 40.63 per cent., fat, 7.63 per cent., and fiber, 8.12 per cent. In other words, each 100 pounds of this brand of feed contained 40.63 pounds of protein, 7.63 pounds of fat and 8.12 pounds of crude fiber. By referring to the table, we see that 88 per cent. of the protein, 93 per cent. of the fat and 56 per cent. of the fiber is digestible. To find out how much of the protein in this feed is used by the animal, is simply done by proportion, thus:

100:88 :: 40.63:35.75, and we find that 35.75 pounds of protein out of 40.63 pounds present, are digestible. In a similar way one can determine the amount of fat and fiber that is digestible.

Although it is not claimed that the figures in the following table are absolutely correct, yet they are useful in ascertaining with approximate accuracy the amounts of available nutrients furnished by different feeding stuffs.

TABLE VI. DIGESTION COEFFICIENTS* OBTAINED IN EXPERIMENTS WITH RUMINANTS.

Name of Feed.	Protein.	Fat.	Fiber.
Cottonseed meal,	88	93	56
Linseed meal, N. P.,	85	97	80
Linseed meal, O. P.,	89	89	57
Gluten meal,	88	94	.....
Gluten feed,	86	84	78
Rye meal,	84	64	.....
Wheat middlings,	80	86	33
Wheat bran,	78	68	29
Brewers' dried grains,	79	91	53
Malt sprouts,	80	100	33
H-O dairy feed,	78	86	41
H-O horse feed,	74	84	35
Victor corn and oat feed,	71	87	48
Corn meal,	68	92	.....
Corn and cob meal,	56	84	46
Oats,†	78	83	26
Barley,†	70	89	66

IS IT POSSIBLE TO STATE FIXED RELATIVE MONEY VALUES FOR FEEDING STUFFS?

In the light of our present knowledge, the only answer that can be given to the above question is negative, although we are able to compute the commercial values of fertilizers. Why, then, can we not follow the same rule in the case of commercial feeds? If it was possible to start with a food containing a single ingredient, we could determine the cost of that ingredient, knowing the ton price of the food in question. But we cannot buy in the market a commercial feeding stuff which contains only protein, for with protein

*Bul. 77, U. S. Dep't of Agr.

†Jordan, The Feeding of Animals.

we must purchase fat, ash and carbohydrates. One can readily see how valuable it would be to the farmer, if when he wishes to expend a certain amount of money for protein, fat or starchy material, he could be able to choose the foods costing the least in proportion to their value.

Jordan* in treating of this subject, has this to say:

"An attempt was made in Germany and to some extent in this country, to calculate by the 'method of least squares' what should be considered the cost of protein, carbohydrates, and fats as based upon the ton prices of a variety of feeding stuffs. Valuations so derived appeared to find favor for a time, and some of our experiment stations, following the lead of German chemists, published pound prices for the three classes of nutrients, and calculated what commercial cattle foods should cost when valued on a common basis. It was soon found, however, that, mathematically as well as practically, most absurd results were obtained.

"In the first place, it is already demonstrated that the money valuations are often greatly influenced by the choice of feeds which shall enter into the calculations." It is true "that varying individual judgments as to the list of feeds which shall determine values may cause absurd differences in the calculated market cost of the nutrients, and introducing into the list or withdrawing from it a comparatively unimportant feeding stuff may lower or raise the price of one nutrient even one-half.

"A still more serious difficulty arises from the fact that often when an apparently typical and proper list of feeds is used from which to calculate prices, the use of the method of least squares results in giving a negative value to one of the nutrients. In several cases of this kind, the fat was shown to be worth less than nothing, a most absurd conclusion. This mathematical method is, therefore, not available for the valuation of feeding stuffs, and so far no mathematician has offered one that is."

In treating the subject further, he states, "If it could be demonstrated that protein has a fixed physiological value twice, and fats three times, that of carbohydrates, it would then be a very simple matter to ascertain what proportion of the cost of a ton of cottonseed meal should be applied to each class of nutrients. Unfortunately, no such a premise can be correctly formulated and there is no promising prospect, at present, of being able to compare foods on the basis of their physiological importance as a means of determining what should be the relative market cost."

WEIGHT OF FEEDING STUFFS.

This table was prepared by weighing a carefully measured quantity of the several feeds.

TABLE VII. AVERAGE WEIGHT† OF ONE QUART OF FEEDS NAMED.

Cottonseed meal,	1.5 lbs.	
Linseed meal, N. P.,	0.9 lbs.	-

*The Feeding of Animals.

†Bul. 106, Mass. (Hatch) Agr'l Exp't Station.

Linseed meal, O. P.,	1.1 lbs.
Gluten meal,	1.7 lbs.
Gluten feed,	1.3 lbs.
Germ oil meal,	1.4 lbs.
Distillers' dried grains,	0.5-0.7 lbs.
Malt sprouts,	0.6 lbs.
Brewers' dried grains,	0.6 lbs.
Wheat middlings (flour),	1.2 lbs.
Wheat middlings (standard),	0.8 lbs.
Mixed feed, wheat,	0.6 lbs.
Wheat bran,	0.5 lbs.
H-O dairy feed,	0.7 lbs.
Oat middlings,	1.5 lbs.
Rye feed,	1.3 lbs.
Oats, whole,	1.0 lbs.
Wheat, whole,	1.9 lbs.
Barley, whole,	1.5 lbs.
Rye, whole,	1.7 lbs.
Corn, whole,	1.7 lbs.
Oats, ground,	0.7 lbs.
Wheat, ground,	1.7 lbs.
Barley meal,	1.1 lbs.
Rye meal,	1.5 lbs.
Corn meal,	1.5 lbs.
Corn and cob meal,	1.4 lbs.
Corn bran,	0.5 lbs.
Hominy meal,	1.1 lbs.
Corn and oat feed, Victor,	0.7 lbs.
Quaker dairy feed,	1.0 lbs.
Oat feed,	0.8 lbs.

DISCUSSION OF THE ANALYTICAL RESULTS.

OIL CAKE MEALS.

Cottonseed Meal.

Analyses on page 39.

Cottonseed meal is obtained by grinding the solid cakes after approximately four-fifths of the oil has been removed from the cottonseed, which has previously been treated to separate the hulls and lint. "Choice" cottonseed meal should be bright yellow in color with a sweet and slightly nutty flavor, free from hulls and lint, and contain 42 per cent. of protein.

The sample analyzed contained 40.63 per cent. of protein and 7.63 per cent. of fat, although guaranteed to carry 43 per cent. of protein and 9 per cent. of fat. It is understood that the guarantee for protein has been changed to 41 per cent. The sample contained a few hulls and some lint.

Linseed Meal.

Analyses on page 39.

Linseed meal is also known on the market as "Oil Meal" and "Flaxseed Meal" and these names are applied to the product obtained by extracting more or less of the oil from ground flaxseed. There are two methods in use for extracting the oil. By the "old process" method, hydraulic pressure is used which removes less of the oil than does the "new process" method which employs naphtha as a solvent. As seen by the analyses, new process meal contains more protein and less fat than the old process meal. All but two of the meals were guaranteed as required by law and only one failed to meet its guarantee for protein. This sample (No. 301) contained 1.64 per cent. less protein than the minimum guarantee of 30 per cent., although there was no evidence of adulteration.

OIL SEED MEAL.*Flaxseed Meal.*

Analyses on page 39.

Three samples of flaxseed meal were analyzed and found of average composition. This material differs from other samples of linseed meal in that the fat has not been removed and, therefore, the percentage of protein is smaller.

DISTILLERY AND BREWERY BY-PRODUCTS.*Distillers' Grains.*

Analyses on page 39.

Distillers' grains are obtained from the cereals, usually corn and rye, in the manufacture of alcohol, whiskey and spirits.

Briefly, the process is as follows:

The grains are treated with a malt solution which converts the starch into sugar. Yeast is then added, thus changing the sugar into alcohol, which can be distilled. The residue left after removing the alcohol, consisting chiefly of the protein, germs and hulls of the grains used, is dried and sold as food for cattle. Distillers' grains, having all the starch removed is consequently richer in protein and fat than the grains from which they are derived. These grains are considered a valuable and economical food for dairy animals.

Four of the six samples analyzed fell a little below the guarantees for protein and two samples of *Continental gluten feed* contained 7 per cent. less than the guarantee of 35 per cent. Only one sample contained less fat than the guarantee.

Brewers' Grains.

Analyses on page 39.

Brewers' grains are obtained from barley in the manufacture of beer. The barley is first placed under conditions favorable to germination and during this process the starch is converted into sugar. The sprouts are removed and sold as cattle food, while the malted grains are crushed, the sugar is extracted and the residue is dried and placed upon the market as dried brewers' grains.

Distillers' and brewers' grains are fairly digestible.

The single sample analyzed was of good quality, but illegally sold without the guarantees of protein and fat.

Malt Sprouts.

Analyses on page 39.

As previously stated the sprouts formed in the germination of barley, are removed and sold as cattle food.

The sprouts contain little fat, but are nitrogenous and valuable as a feeding stuff.

The sample examined, contained a few barley hulls but was of average quality. It was also illegally sold without guarantees.

MAIZE AND ITS BY-PRODUCTS.

Gluten Meal.

Analyses on page 39.

Gluten meal, gluten feed and corn bran are by-products from maize in the manufacture of starch and glucose.

Maize kernels are first soaked in a weak sulphurous acid solution, then crushed, and treated with water. The hulls being the lightest portion, rise to the surface, the germs sink and the starch remains in suspension. The starch finally settles to the bottom, is separated from the germs, while the hulls are floated off, dried and sold as "corn bran."

The meal which contains the hard portion of the kernel is richest in protein, the gluten feed which contains more or less of the hulls contains about 10 per cent. less protein than the meal, while corn bran is lowest in protein and highest in crude fiber.

One often finds on the market material sold as "gluten feed" which is really distillers' grains. The name of a feed is not always a true indication of its nature.

Cream gluten meal, made by the Glucose Sugar Refining Co., Chicago, Ill., fairly met its guarantee of 35 per cent. of protein and 3 per cent. of fat.

Gluten Feed.

Analyses on page 39.

Seven samples of gluten feed were analyzed, four of which were illegally sold without guarantees. No. 314, manufactured by Piel Bros. Starch Co., Indianapolis, Ind., and guaranteed to contain 27 per cent. of protein and 3 per cent. of fat, analyzed 27.38 per cent. of protein and 2.86 per cent. of fat.

Warner's gluten feed, made by Warner Sugar Refining Co., Waukegan, Ill., represented by Nos. 252 and 47, contained 20.75 per cent. protein and 21.50 per cent. protein respectively, although the former was guaranteed to contain 25 per cent. and the latter 27.50 per cent. The fat exceeded the guarantee of 3 per cent. by 1.30 per cent. and 1.43 per cent. respectively.

The guarantee for protein in this brand of gluten feed is altogether too high and it would be well for the manufacturers to make an appreciable reduction.

All samples appeared pure.

Corn Bran.

Analyses on page 39.

One sample of corn bran was analyzed which contained 12.06 per cent. of protein, 3.27 per cent. of fat and 13.27 per cent. of fiber. It sold for \$20 per ton.

Hominy Feed.

Analyses on page 39.

This material is a by-product from the manufacture of hominy and starch. It consists of the hull and germ of the maize kernel, is quite rich in fat and contains a little more protein and fiber than does corn meal.

Sample No. 107 carried 10.44 per cent. of protein and 8.55 per cent. of fat. It was not sold in accordance with the requirements of the law, in that the protein and fat were not guaranteed.

Corn Meal.

Analyses on page 41.

A single sample contained 8.62 per cent. of protein and 3.79 per cent. of fat, and was of good quality. Its fiber content was 1.06 per cent.

Corn Feed Meal.

Analyses on page 41.

This meal, a mixture of corn meal and corn bran, contained 8.98 per cent. of protein, 4.16 per cent. of fat and 3.60 per cent. of fiber. It was made by the Ohio Cereal Co., Circleville, O., and illegally sold without guarantees.

Corn Flour.

Analyses on page 41.

This article which is largely corn starch contained 6.35 per cent. of protein and 3.86 per cent. of fat. The ash and fiber in material of this nature are very low. It is understood that this was not sold as a feeding stuff.

WHEAT OFFALS.

Judging from the amount found in the market, the most popular of all commercial feeding stuffs are the offals obtained from wheat in the manufacture of patent flours.

They consist of particular portions of the wheat kernel. The principal wheat by-products found in the market are the bran, middlings, bran and middlings mixed, and "red dog" flour.

In looking over the analyses of wheat bran and middlings, one notices that many of the samples are very inferior especially as regards their protein content. One sample (No. 255) carried as low as 12.06 per cent. To get at the real cause of the poor quality of the wheat products, correspondence was had with several representative milling concerns in the West, who claim that the inferior quality of the wheat crops of 1904-5 is due partly, if not entirely, to climatic conditions. Under date of Feb. 20, 1906, in a letter to the writer, the Star and Crescent Milling Co., Chicago, Ill., states that

"By-products of wheat in 1904 and 1905 were certainly inferior in quality, especially protein. The crops that year were effected by black smut in the northwest, and the winter crops of the middle and western states ran largely to chaff. We believe the entire matter was due entirely to climatic influences." The following quotation is taken from a letter, bearing the same date, received from Washburn-Crosby Co., Minneapolis, Minn.:

"We beg in reply to say that the 1904 Northwestern crop of spring wheat was a very peculiar one and considerably below standard. The percentage of protein not only in the feed, but in all grades of flour was much lower than usual. * * * Concisely, we should say that the inferior quality was induced by climatic conditions which fostered the rapid spread of black rust. This in turn interfered with the proper development and maturing of a large portion of the crop."

Further comment on this subject seem unnecessary.

Low Grade Flour.

Analyses on page 41.

Low grade flour, or "red dog," is the poorest grade of flour and occupies a place between middlings and high grade flour. When sold as food for domestic animals, the protein and fat contents should be guaranteed. Seven samples were analyzed, and contained an average of 15.51 per cent. of protein and 3.61 per cent. of fat. The average selling price was \$20.86.

Wheat Middlings.

Analyses on pages 41 and 43.

Middlings, which also contain some of the finest bran, is separated from the fine flour and coarse bran in bolting, and consists, chiefly, of the inner layers of the covering of wheat kernels.

Out of forty-nine samples analyzed, only one had the guarantees as required by law. These samples contained an average of 15.23 per cent. of protein and 4.02 per cent. of fat. Nos. 124, 213, 165, 185 and 208 were slightly musty when analyzed and a portion of the fat was destroyed. Sample No. 208 contained 21.15 per cent. of moisture. An excess of moisture in feeds tends to produce molds which destroy the fat present. Millers and dealers should be very cautious to keep their feeds under conditions which will prevent deterioration.

Bran and Middlings.

Analyses on page 43.

A single sample of *Sunshine Mixed Feed* (bran and middlings) was analyzed. This feed is illegally sold without the guarantees.

Buckeye Wheat Feed, which is largely wheat bran, was represented by three samples guaranteed to contain 17.75 per cent. of protein and 4.70 per cent. of fat. The samples showed 13.19, 13.56 and 14.75 percentages of protein, and in one instance the fat was appreciably less than the guaranteed amount. This material, although of inferior quality, was, nevertheless, pure.

Wheat Bran.

Analyses on pages 43 and 45.

Wheat bran consists of the three outer coverings of the wheat kernel, together with the aleurone layer which is rich in protein. Bran contains less protein and more fiber than middlings and on the average a little less fat.

None of the samples analyzed were guaranteed as required by law.

The average percentages found in the pure products were: Protein, 14.30 and fat, 4.48. The figure for protein is about 1 per cent. less than what is contained in wheat bran of good quality.

Two samples of feed sold as *wheat bran* were unquestionably *adulterated*. Sample No. 335, claimed to have been made by the Listman Milling Co., La Crosse, Wis., and sold by H. Pfohl, Pittsburg, contained sufficient *ground corn cob* to reduce the protein and fat contents to 10.44 per cent. and 2.97 per cent., respectively, and raise the fiber content to 16.76 per cent.

Information has been made against the dealer on account of this double violation of the law, and a hearing will be had shortly.

The most common adulterant of wheat bran is probably ground corn cob. Comments on this grossly fraudulent practice are hardly necessary. As this material contains only a small amount of protein and but very little fat, it is *not especially desirable* as food for cattle. The experienced eye can usually detect the presence of corn cob when mixed with wheat bran, but one who is not familiar with its appearance can separate it from the bran by means of an ordinary flour seive. It can often be detected by chewing some of the bran. Under the microscope, it presents distinguishing characteristics.

Another sample of *wheat bran* (No. S. 1), was seriously *adulterated with rice hulls*. In October, a firm in Westmoreland county was selling as bran, a mixture of wheat bran and rice hulls. This feed also contained about 10 per cent. of common salt. As soon as the chemist made his report, information was made against these dealers, who pleaded guilty, paid the stipulated fine and the sale of the goods was stopped.

This is perhaps the most dangerous adulterant used at the present time, because the hull contains sharp particles of silica, which irritate the digestive tract of animals, produce vomiting and may cause their death. It is of inferior value as a food, containing less protein than oat straw, and nearly three times as much ash. The presence of these hulls is usually not difficult to detect with the naked eye. Under a low power microscope, the surface of the hull appears to be traversed with dark lines running parallel to the long axis, while the epidermal cells present characteristics which afford an easy means of detection.

The following quotation* will also serve to give some idea of the nature of rice hulls and their feeding value.

"An inspection of the analyses of rice hulls given in preceding tables shows that these have but a low percentage of protein and fat, and that the percentage of woody matter is high. In addition to that, the tissues of the hull are heavily impregnated with insoluble silica (12.15 per cent.), which renders the work of digestion very

*Bul. 77, Sec. ser., La. Agricultural Experiment Station.

hard. But a greater objection to rice hulls for feeding purposes, is the element of danger which attends their use. The hull of the rice is not only itself very coarse and rough, but the hard silicified fibers, which make it up, are exceedingly harsh and sharp, so that when the hulls are eaten in any quantity, an intense irritation is provoked in the delicate membranes which line the stomach and intestinal tract." Instances of cases where animals died during the feeding of rice hulls, are also reported in the bulletin.

In order to prevent the use of this material, or feeds adulterated with the same, the following "Special Bulletin" was prepared by the writer, and sent to all feed dealers in the State, whose addresses could be secured, and also to the press.

SPECIAL BULLETIN.

PENNSYLVANIA DEPARTMENT OF AGRICULTURE.

Harrisburg, Pa., Nov. 23, 1905.

FEEDING STUFFS CONTROL.

NOTICE OF IMPORTANCE TO FEED DEALERS.

RICE HULLS USED TO ADULTERATE CATTLE FOODS.

Attention is respectfully called to the fact that quite recently we have found that rice hulls are used in Pennsylvania to adulterate feeding stuffs.

Rice hulls are of very inferior value, containing nearly 40 per cent. of woody fiber and a large amount of silica or sand. The outer surface of the hull is harsh and rasping, while the edges carry sharp projections which have a tendency to irritate the digestive tract of animals, and if fed in quantity, may cause their death. Rice hulls are therefore, of little value as a food, detrimental to the health of farm animals and sometimes even dangerous to their lives. So far, rice hulls have been found as an adulterant of wheat bran only, but they may find their way into mixed feeds and standard goods. Every dealer should be on his guard against this grossly fraudulent practice, and for the sake of his reputation, should refuse to handle rice hulls or any feed which is adulterated with the same. In buying feeds from the manufacturer or jobber, the dealer should be sure that the amount of protein and fat is guaranteed, and also should demand a written guarantee that the material is not adulterated in any manner. Every feed dealer in the State should value his reputation. He is responsible for selling adulterated goods and for any injurious effects caused by feeding materials which he handles.

This Department hopes for the co-operation of dealers to the end, that the best results may be secured and the quality of our feeding stuffs may be improved.

F. D. FULLER,
Chemist.

N. B. CRITCHFIELD,
Secretary of Agriculture.

Owing to the extremely dangerous nature of this adulterant, consumers should be on their guard against it.

Several samples of wheat bran were musty when analyzed, as the table indicates.

OAT BY-PRODUCTS.

Analyses on page 45.

There are manufactured to-day, from the cereals a large variety of breakfast foods, and as only the best oat grains, free from hulls, are used for the various oat preparations, the light oats, together with the discarded hulls, enter into the composition of feeds known as "chops," "oat feeds," "corn and oat feeds," "mixed feeds," etc. Oat hulls have an inferior value, containing on the average 3.4 per cent. on protein, 1.3 per cent. of fat and 37.2 per cent. on fiber. Whole oats contain 11.8 per cent. of protein, 5 per cent. of fat and 9.5 per cent. of fiber, on the average, so that the feeding value of the above feeds decreases according to the extent of the adulteration with oat hulls, although the retail prices are not decreased in proportion. In some cases a highly nitrogenous material like cottonseed or linseed meal, is added to a mixture of light oats, oat hulls, wheat and corn. Of course this raises the percentage of protein, but does not increase the value of the hulls.

The successful dairy farmer needs to purchase a certain amount of protein to supply the deficiency found in his rough fodders produced upon the farm, and as a source of protein, it would be more economical to buy the high grade cottonseed and linseed meals, distillers' grains, gluten meals and gluten feeds, at prices ranging from \$20 to \$40 per ton, than to purchase oat and similar feeds for \$15 per ton.

As a rule, as long as the farmer can raise plenty of corn, hay and oats, he can not afford to purchase any feeding stuff containing less than 14 per cent. of protein.

Vim Oat Feed, made by the American Cereal Co., Chicago, Ill., is composed largely of oat hulls. Four samples were not guaranteed and the percentage of protein in the other samples was materially below the guarantee.

Friends' and Royal Oat Feeds, made by the Great Western Cereal Co., Chicago, Ill., contain a large proportion of oat hulls. Two samples of *Friends'* and one of *Royal* were sold with incorrect guarantees and another sample of *Royal* was deficient in protein. An oat feed, (No. 84), made by the Northern Milling Co., Chicago, Ill., was practically oat hulls, containing 3.06 per cent. of protein, 1.22 per cent. of fat and 28.89 per cent. of crude fiber. The average selling price of these feeds was \$13.64 per ton.

MIXED FEEDS.

Proprietary Dairy and Stock Feeds.

Analyses on page 45.

Quaker Dairy Feed, manufactured by the American Cereal Co., Chicago, Ill., consists of corn, oats and wheat products and cottonseed meal. One sample (No. 27) contained 11.56 per cent. of protein and guaranteed 14 per cent. Four samples showed an average of 12.33 per cent. of protein.

H-O Dairy Feed, made by the H-O Co., Buffalo, N. Y., contains corn, oats, wheat, peanuts and cottonseed meal. It was guaranteed to contain 18 per cent. of protein and 4.50 per cent. of fat. The average of four analyses showed 17.67 per cent. of protein and 4.15 per cent. of fat.

Sucrene Dairy Feed, made by the American Milling Co., Chicago, Ill., consists chiefly of molasses, gluten feed, cottonseed meal, malt sprouts, corn, oats, wheat and barley products, and various weed seed. There seems to have been some difficulty in maintaining the guarantees for this article, owing probably to the variation in the composition of the by-products which are used in the formula for compounding this material.

Protina Dairy Feed, made by Ralston Purina Co., St. Louis, Mo., is largely composed of alfalfa, cottonseed meal, gluten feed and linseed meal. Two samples substantially met their guarantees.

Hammond Dairy Feed, made by the Western Grain Products Co., Milwaukee, Wis., consists chiefly of distillers' grains, cottonseed meal, malt sprouts, gluten feed and molasses. The sample analyzed carried 15.59 per cent. of protein and 5.21 per cent. of fat.

Blatchford's Calf Meal, put out by the Blatchford Calf Meal Factory, Waukegan, Ill., could very properly be classed as a condimental preparation, as it contains chiefly a wheat product, cottonseed, linseed and bean meals, fennugreek and anise seed. The sample analyzed practically met its guarantees and sold for \$70 per ton.

Green Diamond Sugar Feed, is substantially the same as Sucrene Dairy Feed, and the single sample examined was low in protein.

Aper Stock Food, made by the Flint Mill Co., Milwaukee, Wis., consists of malt and corn, oats and wheat products. Both the protein and fat in the sample analyzed were a little below the guarantees.

Purina Fattening Food, made by the Ralston Purina Co., St. Louis, Mo., was illegally sold without guarantees. The principal ingredients are alfalfa, together with corn, oats and wheat products. It contained 12.06 per cent. of protein and 5.49 per cent. of fat.

Mueller's Molasses Grains, made by E. P. Mueller, Milwaukee, Wis., is a molasses feed, and the percentages of protein and fat were improperly guaranteed together. Besides molasses it contains malt sprouts and brewers' dried grains, selling at an average price of \$20 per ton.

Proprietary Horse Feeds.

Analyses on pages 45 and 47.

Seven samples of *H-O Co's Horse Feed*, made by the H-O Co., Buffalo, N. Y., guaranteed 12 per cent. of protein and 4.50 per cent. of fat, contained an average of 11.95 per cent. of protein and 4.32

per cent. of fat. This feed is composed of corn, oats and wheat products and peanuts.

Sucrene Horse Feed is a molasses feed which contains in addition, gluten feed, oats, barley, corn and stalks of various cereals. Three samples were examined, one of which was materially deficient in protein and fat.

Proprietary Poultry Foods.

Analyses on page 47.

American Poultry Food, made by the American Cereal Co., Chicago, Ill., guaranteed to contain 14 per cent. of protein and 4.50 per cent. of fat, analyzed 12.13 per cent. of protein and 6.08 per cent. of fat. It is composed of cottonseed meal, corn and wheat products.

The percentages of protein and fat in the sample of *H-O Poultry Feed* exceeded the guarantees of 17 per cent. of protein and 5.50 per cent. of fat. This feed contains wheat bran, corn, rolled oats and peanuts.

Monitor Chick Food, made by the Illinois Seed Co., Chicago, Ill., contains wheat, corn, rice, weed seed, grit and charcoal, and is legally sold without guarantees.

Phoenix Poultry Food, made by the same company, contains wheat, corn, oats, barley, buckwheat, linseed cake, bone, charcoal, sunflower and weed seeds. The percentages of protein and fat in this food should have been guaranteed.

Foutz's Poultry Food, made by the S. A. Foutz Stock Food Co., Baltimore, Md., is a condimental preparation and the principal ingredients identified were corn meal, linseed husks, Epsom salts, lime, sulphur, Venetian red and condiment. This material contained 9.19 per cent. of protein and 6.25 per cent. of ether extract. Its selling price was 15 cents per pound.

Poultry Powder, made by J. J. Fleck, Tiffin, O., is also a condiment composed, chiefly, of mustard hulls, Epsom salts, Venetian red, pepper, sand and shells, and carried 16.69 per cent. of protein, 4.52 per cent. of fat and 15.03 per cent. of crude fiber. The price was 12½ cents per pound.

Much could be written about the so-called condimental and medicinal stock foods found on the market, the principal ingredient of which is wheat offal, linseed or cottonseed meal, sometimes other common feeding stuffs, to which is added special drugs like charcoal, sulphur, salt, gentian, ginger, Epsom and Glanber's salts, Venetian red (an iron compound), fenugreek, etc., apparently for medicinal effect. Such mixtures are worth about \$30 per ton for food purposes and the retail prices vary from \$70 to \$500 per ton. Suffice it to say that *under no circumstances can the farmer afford to buy such foods at the prices asked. A well animal does not need them and if it is sick, the services of a veterinarian should be secured rather than depend upon the drugs supplied by condimental stock foods.*

Miscellaneous Chop Feeds.

Analyses on pages 47 and 49.

Fifty-four samples of feeds analyzed were classed as "chops." A very large majority of the feeds were mixtures of the cereals, chiefly corn and oats, although some contained in addition, small quantities of barley and wheat. Three samples were illegally sold without

guarantees, namely, Nos. 295, 134 and 284, and one of these samples (No. 295), a mixture of corn and light oats, was *adulterated with coffee hulls*. Instances of adulteration of what bran by the addition of coffee hulls have been reported, but the writer has never heard of their use before as an adulterant of a corn and oat product. This material, which is known as "Cornaline," consists of the inner hull of the coffee berry and closely resembles corn bran. It has distinguishing characteristics which, when observed under the microscope, afford a sure means of detection. The average analysis* of two samples of cornaline is 2.69 per cent. of protein, 0.58 per cent. of fat and 58.24 per cent. of fiber.

The "chop" made by the Emporium Milling Co., Emporium, which contained coffee hulls, carried 7.60 per cent. of protein, 4.11 per cent. of fat and 13.05 per cent. of crude fiber. It sold for \$27 per ton.

Boyle's chop (No. 134), made by M. J. Boyle, Johnstown, is a mixture of corn and oat feed and distillers' grains. It was illegally sold without guarantees.

Soft feed, "hay, bran and corn chop" (No. 284), made by P. K. Daly, Philadelphia, was sold without guarantees.

Corn and Oat Feeds.

Analyses on page 49.

Victor Corn and Oat Feed, made by the American Cereal Co., Chicago, Ill., is a mixture of corn, light oats and oat hulls. It was represented by six samples, two of which (Nos. 61 and 333) analyzed considerably below the guarantees of 9 per cent. of protein and 4 per cent. of fat.

Boss Corn and Oat Feed, made by the Great Western Cereal Co., Chicago, Ill., is similar to the Victor brand, and the one sample examined carried 1.50 per cent. less protein than called for by the guarantee. The percentage of fat present exceeded the guarantee by 0.44 per cent.

Corn and Oats Chop.

Analyses on page 49.

Thirty samples of feed sold as *Corn and Oats Chop* were analyzed. Most of the feeds were true to name. Two samples (Nos. 82 and 259) contained an *excess of oat hulls*. No. 82 was made by the Altoona Milling Co., Altoona, and No. 259 by the Northern Milling Co., Lockport, Ill. These feeds were illegally sold without guarantees.

Sample No. 32, *Dairy Corn and Oat Feed*, made by Spanogle & Yeager, Lewistown, contained 1.75 per cent. less protein than the guarantee.

Corn, Oats and Barley.

Analyses on pages 49 and 51.

Corn, Oats and Barley, made by the American Cereal Co., Chicago, Ill., is a mixture of corn, oat and barley feed. Six samples out of the eleven analyzed were deficient in protein and fat. *Schumacher's Stock Feed* (corn, oats and barley), also made by the Ameri-

*Bul. 160, N. J. Agricultural Experiment Stations.

can Cereal Co., was represented by six samples, three of which were deficient in protein and fat.

The company that sold this material to Pennsylvania dealers very wisely agreed to withdraw the inferior article from the market, and either lower the guarantees or improve the quality of this brand of feed.

A sample of *Corn, Oats and Barley* (No. 260), contained an *excess of oat hulls*. This was manufactured by the Northern Milling Co., Lockport, Ill., and not guaranteed.

Mixed Grains.

Analyses on page 51.

Five samples of *Corn, Oats and Rye Chop*, two samples of *Corn, Oats and Wheat*, seven of *Oats and Rye*, and one sample of *Oats, Barley and Rye* were analyzed, all of which were of fair quality.

UNCLASSIFIED FEEDS.

Barley Products.

Analyses on page 51.

Four samples of barley products were analyzed. One sample of *Barley Feed*, made by the Northern Milling Co., Lockport, Ill., and one sample made by the Star and Crescent Milling Co., Chicago, Ill., contained hulls in excess and were illegally sold without guarantees.

Sugar Beet Residue.

Analyses on page 51.

This material is the residue from the manufacture of beet sugar. It consists of the tissues of the beet from which the sugars and some of the soluble compounds have been removed by water. The residue is dried and placed on the market in that condition. *Dried Beet Pulp* is quite digestible. It naturally contains a high percentage of fiber and as the protein is low, it is classed among those feeds which are not economical for the dairyman to purchase.

The average analysis of two samples showed 9.44 per cent. of protein, 0.74 per cent. of fat and 16.57 per cent. of crude fiber. The selling price was \$23 per ton.

ANALYSES OF SAMPLES COLLECTED BY SPECIAL AGENT.

The following table (VIII) shows the partial analyses of samples of feeding stuffs collected by a Special Agent of the Department, during the year 1905. The table also gives the retail price per ton.

ACKNOWLEDGMENTS.

The writer takes great pleasure at this time in acknowledging the many valuable courtesies received from the Secretary of Agriculture.

His advice concerning the problems which have arisen during the year, has been sought many times, and it was always willingly and freely given. I desire, also, to express my appreciation for the helpful co-operation and assistance rendered by Mr. Hutchison, Special Agent of the Department. To both of these gentlemen a large share of the credit is due for the success which the Feeding Stuffs Control has attained during the year 1905.

TABLE VIII. ANALYSES OF SAMPLES OF

Agent's number.	Name and Address of Manufacturer or Jobber.	Sampled at	Chemist's number.
236	Chapin & Co., St. Louis, Mo.,	Coatesville, P. D. Handwork, Man.,	236
55	American Linseed Co., Chicago, Ill.,	York, E. E. Johnston & Co.,	55
59	American Linseed Co., Chicago, Ill.,	York, F. Loucks & Son,	59
253	American Linseed Co., New York, N. Y., ..	Philadelphia, Dunwoody & Co.,	253
264	American Linseed Co., New York, N. Y., ..	Lancaster, J. W. Eshleman,	264
220	Arbuckle & Co., Pittsburg,	Connellsville, Dull & Co.,	220
45	Armstrong & McKelvey, Pittsburg,	Altoona, H. H. Langdon & Son,	45
38	Armstrong & McKelvey, Pittsburg,	Altoona, P. W. Poet,	38
211	McGauge, R. S., Pittsburg,	Jeannette, W. S. Sloan,	211
301	Metzger Seed & Oil Co., Toledo, O.,	Ridgway, Erickson & Hammer,	301
332	National Lead & Oil Co., Pittsburg,	Pittsburg, G. W. Keil & Co.,	332
29	Thompson & Co., Allegheny,	Johnstown, Reitz & Good,	29
292	Unknown,	Punxsutawney, T. C. Zeitler,	292
276	Kolb, Wm., Philadelphia,	Philadelphia, Robert McKnight,	276
257	McAlveen Bros., Philadelphia,	Philadelphia, Dunwoody & Co.,	257
282	Unknown,	Philadelphia, H. P. Mittendorf & Co.,	282
321	Biles, The J. W., Co., Cincinnati, O., ..	Erie, W. J. Carroll,	321
234	Biles, The J. W., Co., Cincinnati, O., ..	Coatesville, P. D. Handwork, Man.,	234
71	Chapin & Co., Philadelphia,	York, F. Z. Stauter,	71
67	Chapin & Co., Philadelphia,	York, Strayer Bros. & Co.,	67
320	Continental Cereal Co., Peoria, Ill.,	Erie, W. J. Carroll,	320
243	Continental Cereal Co., Peoria, Ill.,	Coatesville, P. D. Handwork, Man.,	243
117	Johnstown Dry Grains Co., Johnstown,...	Johnstown, Johnstown Dry Grains Co.,	117
334	Henry & Missert, Buffalo, N. Y.,	Pittsburg, H. Pfohl,	334
315	Glucose Sugar Refining Co., Chicago, Ill.,	Erie, W. J. Carroll,	315
317	Carroll, W. J., Erie,	Erie, Gust Rydberg,	317
235	New York Glucose Co., New York, N. Y., ..	Coatesville, P. D. Handwork, Man.,	235
314	Piel Bros.' Starch Co. Indianapolis, Ind.,	Erie, W. J. Carroll,	314
326	St. Louis Syrup & Pr. Co., St. Louis, Mo.,	Warren, Warren Mills Co.,	326
252	Warner Sugar Refin. Co., Waukegan, Ill.,	Philadelphia, Dunwoody & Co.,	252
47	Warner Sugar Refin. Co., Waukegan, Ill.,	Altoona, James Morgan,	47
250	Warner Sugar Refin. Co., Waukegan, Ill.,	Downingtown, E. Vinton Phillips,	250
319	Glucose Sugar Refin. Co., Chicago, Ill.,	Erie, W. J. Carroll,	319
107	Isett, J. B., Spruce Creek,	Bellwood, Alex. M. Cornmesser,	107

FEEDING STUFFS COLLECTED IN 1905.

Name of Feed.	Moisture.	Protein.		Fat.		Crude fiber.	Price per ton.
		Found.	Guaranteed.	Found.	Guaranteed.		
OIL CAKE MEALS.							
Cottonseed Meal.							
Cottonseed meal, Green Diamond,...	Per ct. 9.12	Per ct. 40.63	Per ct. 43.00	Per ct. 7.63	Per ct. 9.00	Per ct. 8.12	\$28 00
Digestible, .....	.....	35.75	.....	7.09	.....	4.54	.....
Linseed Meal, N. P.							
Flaxmeal, Cleveland,	7.87	35.75	37-40	2.98	1-3	.....	31 00
Flaxmeal, Cleveland,	7.53	36.78	37-40	2.60	1-3	.....	30 00
Average,	7.70	36.27	.....	2.76	.....	.....	30 50
Average digestible, .....	.....	30.83	.....	2.67	.....	.....	.....
Linseed Meal, O. P.							
Linseed meal,	8.74	33.50	32-36	7.15	5-7	.....	32 00
Linseed meal,	9.44	33.00	32-36	6.98	5-7	.....	36 00
Linseed meal,*	8.08	30.97	.....	6.87	.....	.....	40 00
Linseed meal,	8.13	34.50	32.06	6.35	5.20	.....	40 00
Linseed meal,*	8.44	32.69	.....	6.46	.....	.....	50 00
Linseed meal,	9.50	32.81	32.5-37.5	6.71	5.5-7.5	.....	.....
Linseed meal,	9.75	28.38	30-36	7.10	5-7	9.59	40 00
Linseed meal,	7.97	33.06	32.00	8.12	5.20	.....	35 00
Linseed meal,	7.05	32.69	32-37.5	8.06	5.5-8.5	.....	35 00
Linseed meal,	9.20	31.69	30-35	7.37	5.5-6.5	.....	35 00
Average,	8.63	32.33	.....	7.12	.....	.....	38 10
Average digestible, .....	.....	28.77	.....	6.33	.....	.....	.....
OIL SEED MEAL.							
Flaxseed Meal.							
Flaxseed meal,	4.57	21.88	.....	38.08	.....	.....	6c. per lb.
Flaxseed meal,	6.40	21.38	.....	29.39	.....	.....	70 00
Flaxseed meal,	4.12	22.13	.....	36.46	.....	.....	5c. per lb.
Average,	5.03	21.79	.....	31.65	.....	.....	.....
Average digestible, .....	.....	19.82	.....	29.80	.....	.....	.....
DISTILLERY AND BREWERY BY-PRODUCTS.							
Distillers' Grains							
Distillers' dried grains, XXXX,†..	6.07	29.31	33.00	12.50	11.00	.....	25 00
Distillers' dried grains, XXXX, ..	6.80	32.56	33.00	13.22	11.00	.....	27 00
Ajax flakes,	6.62	32.00	33-35	13.59	12.00	11.70	27 00
Ajax flakes,	7.29	30.87	33-35	13.01	12.00	11.95	27 00
Continental gluten feed,†	7.30	27.94	35.00	11.90	12.00	.....	25 00
Continental gluten feed,†	6.96	27.94	35.00	12.70	12.50	.....	29 00
Average,†	6.69	31.19	.....	13.08	.....	.....	24 50
Average digestible, .....	.....	22.76	.....	11.90	.....	.....	.....
Brewers' Grains.							
Brewers' dried grains,*	6.82	28.50	.....	7.27	.....	11.62	20 00
Digestible, .....	.....	22.51	.....	6.61	.....	6.15	.....
Malt Sprouts.							
Malt sprouts,*	9.05	25.13	.....	1.53	.....	.....	20 00
Digestible, .....	.....	20.10	.....	1.53	.....	.....	.....
MAIZE AND ITS BY-PRODUCTS							
Gluten Meal.							
Gluten meal, Cream,	8.70	34.38	35.00	2.34	3.00	.....	30 00
Digestible, .....	.....	30.25	.....	2.20	.....	.....	.....
Gluten Feed.							
Gluten feed,*	8.90	23.44	.....	4.17	.....	7.22	24 00
Gluten feed, Globe,*	7.44	25.94	.....	2.88	.....	.....	27 00
Gluten feed,	6.15	27.38	27.00	2.86	3.00	.....	25 00
Gluten feed,*	8.60	26.25	.....	3.69	.....	.....	24 00
Gluten feed, Warner's,†	8.47	20.75	25.00	3.30	3.00	.....	27 00
Gluten feed, Warner's,†	7.76	21.50	27.50	4.43	3.00	.....	27 00
Gluten feed, Warner's,*	7.54	21.06	.....	3.28	.....	.....	24 50
Average,	7.84	23.76	.....	3.52	.....	.....	25 50
Average digestible, .....	.....	20.43	.....	2.95	.....	.....	.....
Corn Bran.							
Corn bran, Fancy,	8.62	12.06	13.00	3.27	3.00	13.27	20 00
Hominy Chop							
Hominy chop,*	9.18	10.44	.....	8.55	.....	4.18	26 00
Digestible, .....	.....	7.10	.....	7.86	.....	.....	.....

*Illegally sold without guarantees.

†Illegally sold with incorrect guarantee for protein.

‡Excluding Nos. 320 and 243.

TABLE VIII. ANALYSES OF SAMPLES OF FEED

Agent's number.	Name and Address of Manufacturer or Jobber.	Sampled at	Chemist's number.
230	Ohio Cereal Co., Circleville, O.,	Pittsburg, G. W. Keil & Co.,	339
291	American Cereal Co., Chicago, Ill.,	Punxsutawney, T. C. Zeitler,	291
265	American Hominy Co., Indianapolis, Ind., ..	Lancaster, J. W. Eshleman,	265
127	Berger & Crittenden, Milwaukee, Wis., ...	Conemaugh, Sherbine Bros.,	127
178	Christian, Geo. C., Minneapolis, Minn., ...	Osceola Mills, McLarren Bros.,	178
155	Dwight Flour Mills, Minneapolis, Minn., ...	Lock Haven, E. E. Wentz,	155
287	Pillsbury Washburn Flour Mill Co., Minneapolis, Minn., ..	Punxsutawney, J. C. Barton,	287
219	Star & Crescent Milling Co., Chicago, Ill., ..	Connellsville, Dull & Co.,	219
339	Washburn-Crosby Co., Minneapolis, Minn., ..	Pittsburg, Herb Bros.,	339
111	Star & Crescent Milling Co., Chicago, Ill., ..	Johnstown, Penn Traffic Co.,	111
124	Akeney, W. S., Minneapolis, Minn.,	Conemaugh, F. B. Custer,	124
223	Bailey, E. I., Cleveland, O.,	New Haven, Kell Long,	223
254	Baker's Sons, Winchester, Va.,	Philadelphia, Dunwoody & Co.,	254
195	Barber Mill Co., Minneapolis, Minn.,	Clearfield, F. M. Cardon,	195
86	Biddle, T. M., Altoona,	Altoona, D. S. Ferguson,	86
245	Christian, Geo. C., Minneapolis, Minn., ...	Coatesville, J. T. Gay & Son,	245
246	Christian, Geo. C., Minneapolis, Minn., ...	Coatesville, J. T. Gay & Son,	246
325	Coombs, W. A., Milling Co., Coldwater, Mich., ..	Warren, Warren Mills Co.,	325
158	Copelin, Duke, Philipsburg,	Philipsburg, Duke Copelin,	153
328	Crouch Bros. & Co., Erie,	Warren, J. W. Armstrong,	328
143	Crouch Bros. & Co., Erie,	Lock Haven, A. Simon's Sons,	143
297	Emporium Milling Co., Emporium,	Emporium, C. B. Howard & Co.,	297
172	Gamble, Gheen & Co., Bellefonte,	Lock Haven, Rothrock Bros.,	172
105	Hagerty, Frank, Arch Springs,	Bellwood, L. W. Irvin & Co.,	105
131	Harter, Isaac, The, Co., Toledo, O.,	Johnstown, M. J. Boyle,	131
121	Hunter, O. L., & Co., Chicago, Ill.,	Johnstown, G. Bostert & Son,	121
213	Jeannette Milling Co., Jeannette,	Jeannette, Trimble & Ford,	213
147	Knecht Bros., Parvin,	Lock Haven, Jacob Brown's Sons,	147
73	Krause, P. C., Minneapolis, Minn.,	Altoona, C. Hauser & Son,	73
165	Lake Crystal Mill Co., Lake Crystal, Minn., ..	Philipsburg, L. G. Kessler Co.,	165
137	Listman Mill Co., La Crosse, Wis.,	Tyrone, Warren Richard,	137
103	Mentzer, F. & T., Frankstown,	Altoona, F. E. Mitchell & Co.,	103
114	New Prague Flour Mill Co., New Prague, Minn., ..	Johnstown, Johnstown Dry Grains Co.,	114
217	Northern Ele. & Mill Co., Mt. Vernon, O., ..	Connellsville, Dull & Co.,	217
113	Northern Milling Co., Chicago, Ill.,	Johnstown, Penn Traffic Co.,	113
80	Northern Milling Co., Lockport, Ill.,	Altoona, Klepser Bros.,	80
186	Pillsbury Mill Co., Minneapolis, Minn., ...	Morrisdale Mines, Morrisdale Supply Co., ..	186
331	Pittsburg Milling Co., Allegheny,	Pittsburg, G. W. Keil & Co.,	331
278	Quaker City Flour Mill Co., Phila.,	Philadelphia, J. F. Jones,	278
109	Quirk, James, Milling Co., Montgomery, Minn., ..	Bellwood, Alex. M. Cornmesser,	109
190	Reidy, H. A., Wallacetown,	Morrisdale Mines, Chas. Wrye,	190
271	Rolla Roller Mills, The, Rolla, N. Dak., ...	Lancaster, Nein & Fisher,	271
139	Royal Milling Co., Minneapolis, Minn., ...	Lock Haven, Scott Bros.,	139
153	Royal Milling Co., The, Buffalo, N. Y., ...	Lock Haven, E. E. Wentz,	153
89	Sheffield-King Milling Co., Minneapolis, Minn., ..	Altoona, H. R. Earlenbaugh,	89
94	Sheffield-King Milling Co., Minneapolis, Minn., ..	Juniata, Hoover Merchandise Co.,	94
227	Stanard Mill Co., St. Louis, Mo.,	Uniontown, M. A. Clark,	227
75	Star & Crescent Milling Co., Chicago, Ill., ..	Altoona, C. Hauser & Son,	75
128	Swope Bros., Johnstown,	Conemaugh, S. Gearhart,	128
197	Thornton & Chester, Buffalo, N. Y.,	Clearfield, J. W. Eberts,	197
169	Toledo Grain & Milling Co., Toledo, O.,	Lock Haven, M. L. Claster,	169
185	Toledo Grain & Milling Co., Toledo, O.,	Philipsburg, Decatur Trading Co.,	185
206	Toledo Grain & Milling Co., Toledo, O.,	Houtzdale, R. Madigan,	206
208	Toledo Grain & Milling Co., Toledo, O.,	Houtzdale, R. Madigan,	208
167	Truckenmiller, F. E., Watsonstown,	Lock Haven, M. L. Claster,	167

*Illegally sold without guarantees.

†Persons engaged, within the State of Pennsylvania, in the business of manufacturing flours, may sell, at the place where made, their own manufacture of bran and middlings, without complying with the provisions of Section 1, Act 78, Laws of 1901. All other makes are illegally sold without guarantees.

ING STUFFS COLLECTED IN 1905.—Continued.

Name of Feed.	Moisture.	Protein.		Fat.		Crude fiber.	Price per ton.
		Found.	Guaranteed.	Found.	Guaranteed.		
<i>Corn Meal.</i>	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	
Corn meal,	12.73	8.62	.....	3.79	.....	1.06	\$27 00
Digestible, .....	.....	5.86	.....	3.48	.....	.....	.....
<i>Corn Feed Meal.</i>							
Corn feed meal,*	13.51	8.98	.....	4.16	.....	3.60	27 30
<i>Corn Flour</i>							
Corn flour, "C. F.,"	13.45	6.35	.....	3.86	.....	.....	31 50
WHEAT OFFALS.							
<i>Low Grade Flour</i>							
Red dog flour,	9.60	16.25	.....	4.58	.....	.....	28 00
Red dog flour,*	11.57	15.00	.....	3.82	.....	.....	30.00
Red dog flour,	10.90	14.44	.....	3.33	.....	.....	26.00
Red dog flour, XX dairy,	11.06	17.31	.....	4.59	.....	.....	28 00
Red dog flour, Star,	10.58	14.81	.....	3.44	.....	.....	27 00
Red dog flour,	9.17	17.88	.....	4.42	.....	.....	26 00
Low grade flour,	10.95	12.88	.....	2.48	.....	.....	30 00
Average,	10.55	15.51	.....	3.61	.....	.....	29.83
Average digestible, .....	.....	12.40	.....	3.10	.....	.....	.....
<i>Wheat Middlings †</i>							
Middlings, flour, ‡	15.55	15.31	.....	0.96	.....	.....	23.00
Middlings,	9.89	15.50	.....	4.33	.....	.....	24 00
Middlings,	10.02	14.44	.....	4.17	.....	.....	20 00
Middlings, white,	10.07	15.50	.....	4.40	.....	.....	28.00
Middlings, Gem,	10.94	14.81	\$8.50	2.90	\$3.00	5.19	28 00
Middlings, brown,	10.89	15.06	.....	1.93	.....	.....	23 00
Middlings, white,	10.45	14.94	.....	4.82	.....	.....	24 00
Middlings,	10.55	13.69	.....	3.30	.....	.....	24 00
Middlings,	10.60	14.44	.....	3.30	.....	.....	30 00
Middlings,	11.30	14.69	.....	4.17	.....	.....	29 00
Middlings, white,	11.15	12.69	.....	3.27	.....	1.99	30 00
Middlings,	9.70	18.63	.....	5.65	.....	.....	27 00
Middlings, fresh ground,	10.99	15.88	.....	4.18	.....	.....	28 00
Middlings, white,	11.40	19.06	.....	4.96	.....	.....	30 00
Middlings,	8.86	14.44	.....	5.06	.....	.....	27 00
Middlings, fresh ground,	9.75	18.00	.....	5.10	.....	.....	22 00
Middlings, ‡	14.05	14.25	.....	1.55	.....	.....	28 00
Middlings, winter wheat,	10.74	16.44	.....	4.90	.....	.....	27 00
Middlings, white, || .....	11.29	11.25	.....	2.30	.....	0.39	32.00
Middlings, ‡	12.49	15.56	.....	2.56	.....	.....	30 00
Middlings, Elmco standard,	10.04	16.38	.....	4.86	.....	.....	25 00
Middlings,	11.72	13.25	.....	2.72	.....	2.54	28 00
Middlings, Go-Far,	9.47	15.00	.....	4.95	.....	.....	24 00
Middlings, Taylor's,	9.30	17.56	.....	4.49	.....	.....	26 00
Middlings,	10.43	15.31	.....	4.41	.....	.....	28 00
Middlings, brown,	10.59	16.19	.....	4.45	.....	5.41	25 00
Middlings, dairy,	10.55	15.69	.....	4.84	.....	.....	30 00
Middlings,	9.85	15.69	.....	4.78	.....	.....	22 00
Middlings,	10.32	15.31	.....	4.50	.....	.....	23 00
Middlings, fancy,	11.14	15.63	.....	5.07	.....	.....	27 00
Middlings, brown,	11.14	14.50	.....	4.45	.....	.....	30 00
Middlings (Dairy feed),	9.98	15.13	.....	4.79	.....	.....	20 00
Middlings, Ben Hur standard,	10.33	15.75	.....	5.04	.....	.....	25 00
Middlings, Ben Hur flour,	10.25	15.31	.....	4.37	.....	.....	26 00
Middlings,	12.68	14.38	.....	3.35	.....	5.93	28 00
Middlings,	10.92	14.31	.....	4.20	.....	5.07	30 00
Middlings,	10.01	15.50	.....	4.90	.....	.....	25 00
Middlings, brown,	10.40	14.88	.....	4.95	.....	5.10	26.00
Middlings, choice white,	10.27	15.13	.....	4.15	.....	.....	27 00
Middlings,	9.71	14.88	.....	4.83	.....	.....	25 00
Middlings, white,	9.60	13.63	.....	5.07	.....	.....	30 00
Middlings, white, ‡	12.10	13.56	.....	1.95	.....	3.34	30 00
Middlings, white, No. 2,	9.60	14.38	.....	5.77	.....	.....	25 00
Middlings, white, ‡	21.15	14.00	.....	0.93	.....	.....	28 00
Middlings, brown,	10.52	16.38	.....	4.74	.....	.....	23 00

‡Sample slightly musty. Portion of fat destroyed.

§Statement of dealer. Manufacturer guarantees Protein, 10.1 per cent., Fat, 2.1 per cent.

||Chiefly wheat flour. Ash, 1.16 per cent.

TABLE VIII. ANALYSES OF SAMPLES OF FEED

Agent's number.	Name and Address of Manufacturer or Jobber.	Sampled at	Chemist's number.
270	Washburn-Crosby Co., Minneapolis, Minn.,	Lancaster, J. W. Eshleman,	270
204	Woomer, Isaac, Graysville,	Houtzdale, J. O'Connor,	204
233	Unknown,	Coatesville, P. D. Handwork, Man.,	233
118	Unknown,	Johnstown, John Thomas & Son,	118
177	American Cereal Co., The, Chicago, Ill.,	Osceola Mills, McLarren Bros.,	177
3	American Cereal Co., The, Chicago, Ill.,	Greensburg, J. W. Pollins Co.,	3
290	American Cereal Co., The, Chicago, Ill.,	Punxsutawney, T. C. Zeitler,	290
5	Hunter Bros. Milling Co., St. Louis, Mo.,	Greensburg, Hudson & Kuhns,	5
132	American Cereal Co., The, Chicago, Ill.,	Johnstown, M. J. Boyle,	132
337	Austin Bros., Pittsburg,	Pittsburg, Edward Goedberg,	337
269	Barber Milling Co., Minneapolis, Minn.,	Lancaster, J. W. Eshleman,	269
96	Bare Milling Co., Roaring Spring,	Juniata, West Bros.,	96
198	Berger-Crittenden Co., Milwaukee, Wis.,	Clearfield, J. W. Eberts & Co.,	198
87	Biddle, T. M., Altoona,	Altoona, D. S. Ferguson,	87
104	Christian, Geo. C., Minneapolis, Minn.,	Bellwood, L. W. Irwin & Co.,	104
244	Christian, Geo. C., Minneapolis, Minn.,	Coatesville, J. T. Gay & Son,	244
324	Coombs, W. A., Milling Co., Coldwater, Mich.,	Warren, Warren Mills Co.,	324
157	Copelin, Duke, Phillipsburg,	Phillipsburg, Duke Copelin,	157
183	Copelin, Duke, Phillipsburg,	Phillipsburg, Pa., Mercantile Co.,	183
173	Crouch Bros. & Co., Erie,	Lock Haven, Rothrock Bros.,	173
144	Crouch Bros. & Co., Erie,	Lock Haven, A. Simon's Sons,	144
285	Dunwoody & Co., Philadelphia,	Philadelphia, P. K. Daly,	285
181	Dwight Flour Mills, Minneapolis, Minn.,	Osceola Mills, F. Hirsh,	181
272	Eagle Flouring Mill Co., Milwaukee, Wis.,	Lancaster, Nein & Fisher,	272
296	Emporium Milling Co., Emporium,	Emporium, C. B. Howard & Co.,	296
222	Hardman & Heck, Pittsburg,	New Haven, Kell Long,	222
7	Hoffer, John, Steelton,	Harrisburg, C. F. Gohl,	7
120	Hubbard Milling Co., Mankato, Minn.,	Johnstown, J. Thomas & Son,	120
91	Hunter Bros. Milling Co., St. Louis, Mo.,	Altoona, M. P. Brumbaugh,	91
85	Hunter Bros. Milling Co., St. Louis, Mo.,	Altoona, Spanogle & Yeager,	85
304	Imperial Milling Co., Duluth, Minn.,	Ridgway, Smith Bros. & Co., Ltd.,	304
310	Jones, Alfred, Co., Buffalo, N. Y.,	Erie, Geo. L. Seigler,	310
90	Klepser Bros., Altoona,	Altoona, C. E. Miller,	90
335	Listman Milling Co., La Crosse, Wis.,	Pittsburg, H. Pfohl,	335
128	Listman Milling Co., La Crosse, Wis.,	Tyrone, W. Richard,	128
100	McFarland Supply Co., Greensburg,	New Alexandria, J. E. Gallagher,	100
97	Mentzer, F. & T., Frankstown,	Altoona, F. E. Mitchell & Co.,	97
140	Mentzer, F. & T., Frankstown,	Altoona, S. T. Moffit,	140
79	New Prague Flour Mill Co., New Prague, Minn.,	Lock Haven, Scott Bros.,	79
258	Northern Milling Co., Lockport, Ill.,	Altoona, Klepser Bros.,	258
275	Northern Milling Co., Lockport, Ill.,	South Fork, A. D. Strong,	275
255	Pickway Flouring Co., Pickway, O.,	Philadelphia, Dunwoody & Co.,	255
162	Pillsbury Flour Mill Co., Minneapolis, Minn.,	Philadelphia, Dunwoody & Co.,	162
281	Pillsbury Flour Mill Co., Minneapolis, Minn.,	Phillipsburg, C. T. Fryberger,	281
187	Pillsbury Flour Mill Co., Minneapolis, Minn.,	Philadelphia, H. P. Mittendorf & Co.,	187
230	Pittsburg Milling Co., Pittsburg,	Morrisdale Mines, Morrisdale Supply Co.,	230
279	Quaker City Flour Mill Co., Philadelphia,	Scottsdale, Campbell & Hepler,	279
277	Quaker City Flour Mill Co., Philadelphia,	Philadelphia, J. F. Jones,	277
108	Quirk, James, Montgomery, Minn.,	Philadelphia, Robert McKnight,	108
164	Reidy, H. A., Wallaceton,	Bellwood, Alex. M. Cornmesser,	164
191	Reidy, H. A., Wallaceton,	Phillipsburg, L. G. Kessler Co.,	191
154	Royal Milling Co., Buffalo, N. Y.,	Morrisdale Mines, Charles Wrye,	154
92	Sheffield-King Milling Co., Minneapolis, Minn.,	Lock Haven, E. E. Wentz,	92
226	Stanard Milling Co., St. Louis, Mo.,	Juniata, Hoover Merchandise Co.,	226
261	Star & Crescent Milling Co., Chicago, Ill.,	Uniontown, M. A. Clark,	261
218	Star & Crescent Milling Co., Chicago, Ill.,	Windber, J. E. Crisman,	218
74	Star & Crescent Milling Co., Chicago, Ill.,	Connellsville, Dull & Co.,	74
112	Star & Crescent Milling Co., Chicago, Ill.,	Altoona, C. Hauser & Son,	112
		Johnstown, Penn Traffic Co.,	

ING STUFFS COLLECTED IN 1905.—Continued.

Name of Feed.	Moisture.	Protein.		Fat.		Crude fiber.	Price per ton.
		Found.	Guaranteed.	Found.	Guaranteed.		
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	
Middlings,	10.00	17.69	.....	5.34	.....	.....	\$17 75
Middlings, white,	11.72	15.50	.....	3.17	.....	.....	30 00
Middlings, winter wheat,	10.90	15.38	.....	4.06	.....	.....	25 00
Middlings, fancy A No. 1 flour,	9.90	14.00	.....	4.06	.....	.....	23 00
Middlings,	10.71	15.23	.....	4.02	.....	.....	26 22
Average,* .....	.....	12.18	.....	3.45	.....	.....	.....
Average digestible, .....	.....	.....	.....	.....	.....	.....	.....
<i>Bran and Middlings.</i>							
Wheat feed, Buckeye,†	11.95	13.19	17.75	3.73	4.70	.....	28 00
Wheat feed, Buckeye,†	9.35	13.56	17.75	4.99	4.70	8.01	23 00
Wheat feed, Buckeye,†	9.59	14.75	17.75	4.27	4.70	.....	24 00
Mixed feed, Sunshine,†	9.11	14.44	.....	4.71	.....	7.88	24 00
Average,	10.00	13.99	.....	4.43	.....	.....	24 75
Average digestible, .....	.....	11.05	.....	3.41	.....	.....	.....
<i>Wheat Bran §</i>							
Wheat bran,	10.08	13.81	.....	4.41	.....	7.49	24 00
Wheat bran,	9.65	15.50	.....	4.38	.....	.....	18 00
Wheat bran,	9.25	14.44	.....	4.59	.....	.....	17.75
Wheat bran,	10.61	15.06	.....	4.44	.....	7.16	28 00
Wheat bran, Badge,	9.91	13.19	.....	4.10	.....	9.18	25 00
Wheat bran,	10.00	14.13	.....	4.09	.....	9.22	26 00
Wheat bran, Jersey,	10.23	13.75	.....	4.60	.....	10.54	26 00
Wheat bran,	11.82	12.69	.....	4.82	.....	10.24	18 50
Wheat bran,	9.53	14.63	.....	4.37	.....	.....	20 00
Wheat bran, winter,	10.10	15.56	.....	4.47	.....	.....	25 00
Wheat bran,	10.60	13.13	.....	4.01	.....	10.25	30 00
Wheat bran,	10.75	14.44	.....	4.85	.....	.....	25 00
Wheat bran,	13.05	14.69	.....	4.03	.....	.....	25 00
Wheat bran, winter,	9.70	15.13	.....	4.51	.....	.....	20 00
Wheat bran,	10.35	12.88	.....	4.26	.....	10.62	27 00
Wheat bran,	9.04	13.50	.....	4.53	.....	.....	18 00
Wheat bran,	10.33	16.56	.....	4.90	.....	.....	22 00
Wheat bran, spring,	9.53	16.13	.....	4.37	.....	.....	22 00
Wheat bran,	9.39	16.00	.....	4.38	.....	8.73	24 00
Wheat bran, Hubbard fancy flake	9.45	13.00	.....	4.79	.....	.....	23 00
Wheat bran,	10.20	14.06	.....	4.51	.....	8 00	33 00
Wheat bran,	10.57	14.06	.....	4.40	.....	8.02	23 00
Wheat bran,	10.12	14.44	.....	4.47	.....	.....	25 00
Wheat bran,	8.97	15.06	.....	4.88	.....	.....	18 00
Wheat bran,	10.35	14.25	.....	4.64	.....	7.99	30 00
Wheat bran,**	8.30	10.44	.....	2.97	.....	16.76	20.00
Wheat bran, Elmco fancy,	9.50	13.06	.....	4.57	.....	9.64	22 00
Wheat bran,††	8.67	9.06	.....	2.64	.....	14.51	.....
Wheat bran,	10.78	16.00	.....	4.27	.....	7.56	28 00
Wheat bran,	11.05	16.13	.....	4.02	.....	7.72	28 00
Wheat bran, Broad flake,††	12.25	14.50	.....	2.27	.....	.....	24 00
Wheat bran,	9.48	14.06	.....	4.77	.....	9.22	22 00
Wheat bran,	9.93	14.50	.....	4.64	.....	.....	25 00
Wheat bran,	9 35	15.06	.....	4.23	.....	.....	17 00
Wheat bran, spring,	9.03	12.06	.....	5.08	.....	10.23	17 00
Wheat bran,	10.35	12.50	.....	5.18	.....	.....	25 00
Wheat bran,	9.55	14.25	.....	4.72	.....	.....	21 00
Wheat bran,	10.52	12.25	.....	4.55	.....	10.99	30 00
Wheat bran,	9.07	13.19	.....	5.01	.....	.....	20 00
Wheat bran,	9.54	14.69	.....	4.89	.....	.....	21 00
Wheat bran,	10.15	15.75	.....	5.34	.....	.....	20 00
Wheat bran,	11.11	13.38	.....	3.95	.....	9.72	20 00
Wheat bran,	10.52	13.94	.....	5.39	.....	.....	28 00
Wheat bran,	9.92	14.25	.....	3.70	.....	.....	30 00
Wheat bran, Ben Hur coarse,	10.00	13.38	.....	5.06	.....	.....	23 00
Wheat bran,	10.31	13.13	.....	4.45	.....	10.03	30 00
Wheat bran,	9.15	14.63	.....	4.52	.....	.....	20 00
Wheat bran,	10.00	14.44	.....	4.59	.....	.....	19 00
Wheat bran, Star winter,	9.94	13.94	.....	4.81	.....	.....	24 00
Wheat bran,	10.28	13.50	.....	5.72	.....	9.21	24 00
Wheat bran, spring,	10.62	13.63	.....	4.57	.....	.....	26 00

*Excluding No. 208.

†Illegally sold with incorrect guarantee for protein.

‡Illegally sold without guarantees.

§See foot note † page 40.

||Statement of dealer.

**Adulterated with ground corn cob.

††Adulterated with rice hulls.

‡‡Sample slightly musty. Portion of fat destroyed.

TABLE VIII. ANALYSES OF SAMPLES OF FEED

Agent's number.	Name and Address of Manufacturer or Jobber.	Sampled at	Chemist's number.
130	Swope Bros., Johnstown,	Conemaugh, S. Gearhart,	130
168	Toledo Grain & Milling Co., Toledo, O.,	Lock Haven, M. L. Claster,	168
125	Toledo Grain & Milling Co., Toledo, O.,	Conemaugh, F. B. Custer,	125
207	Toledo Grain & Milling Co., Toledo, O.,	Houtzdale, R. Madigan,	207
201	Washburn-Crosby Co., Minneapolis, Minn.,	Houtzdale, Eureka Supply Co., Ltd.,	201
148	White Milling Co., Clintondale,	Lock Haven, Jacob Brown's Sons,	148
151	White Milling Co., Clintondale,	Lock Haven, Mussina & Reed,	151
205	Woomer, Isaac, Graysville,	Houtzdale, J. O'Connor,	205
81	American Cereal Co., The, Chicago, Ill.	Altoona, Altoona Mill Co.,	81
338	American Cereal Co., The, Chicago, Ill.	Pittsburg, Herb Bros.,	338
54	American Cereal Co., The, Chicago, Ill.	York, E. E. Johnston & Co.,	54
62	American Cereal Co., The, Chicago, Ill.	York, E. E. Johnston & Co.,	62
274	American Cereal Co., The, Chicago, Ill.	Lancaster, Fred Pontz,	274
68	American Cereal Co., The, Chicago, Ill.	York, Strayer Bros.,	68
69	American Cereal Co., The, Chicago, Ill.	York, Strayer Bros.,	69
249	Great Western Cereal Co., The, Chicago, Ill.,	Downington, E. V. Philips,	249
263	Great Western Cereal Co., The, Chicago, Ill.,	Lancaster, J. W. Eshleman,	263
20	Great Western Cereal Co., The, Chicago, Ill.,	Sunbury, Blank & Gotshall,	20
268	Great Western Cereal Co., The, Chicago, Ill.,	Lancaster, J. W. Eshleman,	268
8	Great Western Cereal Co., The, Chicago, Ill.,	Harrisburg, M. Herman & Son,	8
84	Northern Milling Co., The, Chicago, Ill.,	Altoona, P. W. Poet,	84
242	American Cereal Co., The, Chicago, Ill.,	Coatesville, P. D. Handwork, Man.,	242
10	American Cereal Co., The, Chicago, Ill.,	Harrisburg, Mock & Sanderson,	10
4	American Cereal Co., The, Chicago, Ill.,	Greensburg, J. W. Pollins Co.,	4
27	American Cereal Co., The, Chicago, Ill.,	Johnstown, Reitz & Good,	27
202	H-O Co., The, Buffalo, N. Y.,	Houtzdale, Eureka Supply Co.,	202
238	H-O Co., The, Buffalo, N. Y.,	Coatesville, P. D. Handwork, Man.,	238
64	H-O Co., The, Buffalo, N. Y.,	York, J. W. Royer,	64
293	H-O Co., The, Buffalo, N. Y.,	Punxsutawney, G. A. Weiss & Bro.,	293
18	American Milling Co., Chicago, Ill.,	Sunbury, Blank & Gottshall,	18
266	American Milling Co., Owensboro, Ky.,	Lancaster, J. W. Eshleman,	266
300	American Milling Co., Owensboro, Ky.,	Ridgway, C. O., Salberg,	300
313	Ralston Purina Co., St. Louis, Mo.,	Erie, W. J. Carroll,	313
248	Ralston Purina Co., St. Louis, Mo.,	Coatesville, P. D. Handwork, Man.,	248
322	Western Grain Products Co., Milwaukee, Wis.,	Warren, Warren Mills Co.,	322
15	Blatchford's Calf Meal Factory, Waukegan, Ill.,	Huntingdon, Stauffer & Brenaman,	15
318	Chapin & Co., Buffalo, N. Y.,	Erie, W. J. Carroll,	318
237	Flint Mill Co., Milwaukee, Wis.,	Johnstown, M. J. Boyle,	237
133	Ralston Purina Co., St. Louis, Mo.,	Erie, P. A. Allen,	133
311	Ralston Purina Co., St. Louis, Mo.,	Philadelphia, Dunwoody & Co.,	311
256	Mueller, E. P., Milwaukee, Wis.,	Philadelphia, Dunwoody & Co.,	256
58	Mueller, E. P., Milwaukee, Wis.,	York, F. Loucks & Son,	58
70	Mueller, E. P., Milwaukee, Wis.,	York, H. S. Myers,	70
196	H-O Co., The, Buffalo, N. Y.,	Clearfield, J. W. Eberts & Co.,	196
237	H-O Co., The, Buffalo, N. Y.,	Coatesville, P. D. Handwork, Man.,	237
12	H-O Co., The, Buffalo, N. Y.,	Lewistown, Haverly Co.,	12
63	H-O Co., The, Buffalo, N. Y.,	York, J. W. Royer,	63
14	H-O Co., The, Buffalo, N. Y.,	Huntingdon, Stauffer & Brenaman,	14
30	H-O Co., The, Buffalo, N. Y.,	Johnstown, J. Thomas & Sons,	30

*Sample slightly musty. Portion of fat destroyed.

†Excluding Nos. 335 and 81.

‡Not sold by the dealer.

§Illegally sold without guarantees.

||Illegally sold with incorrect guarantee for protein.

**Illegally sold with incorrect guarantees.

ING STUFFS COLLECTED IN 1905.—Continued.

Name of Feed.	Moisture.	Protein.		Fat.		Crude fiber.	Price per ton.
		Found.	Guaranteed.	Found.	Guaranteed.		
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	
Wheat bran,*	12.85	15.56	.....	2.67	.....	.....	\$26 00
Wheat bran, winter,	9.92	13.94	.....	4.56	.....	.....	22 00
Wheat bran,	9.75	14.25	.....	4.43	.....	.....	22 00
Wheat bran,	9.56	14.94	.....	4.02	.....	.....	24 00
Wheat bran,	10.01	14.81	.....	4.40	.....	.....	28 00
Wheat bran, Lincoln,	11.15	14.50	.....	4.35	.....	.....	25 00
Wheat bran,	10.69	15.38	.....	4.69	.....	.....	25 00
Wheat bran,	9.97	15.56	.....	3.93	.....	.....	24 00
Wheat bran,	10.18	14.30	.....	4.48	.....	.....	23 74
Average,†	.....	.....	.....	.....	.....	.....	.....
Average digestible,	.....	11.15	.....	3.04	.....	.....	.....
OAT BY-PRODUCTS.							
Oat feed, Vim,‡	8.02	6.69	7.30	2.96	2.75	24.02	.....
Oat feed, Vim,	5.90	6.56	7.50	2.95	2.75	23.97	12 00
Oat feed, Vim,§	7.31	4.94	.....	2.23	.....	27.19	12 00
Oat feed, Vim,§	7.56	3.69	.....	1.48	.....	28.99	12 00
Oat feed, Vim,§	6.94	5.31	7.50	2.30	2.75	.....	11 00
Oat feed, Vim,||	7.15	4.81	.....	1.98	.....	27.51	14 00
Oat feed, Vim,§	7.27	4.81	.....	2.00	.....	27.87	14 00
Oat feed, Vim,§	8.15	4.75	8.00	1.88	3.00	27.94	20 00
Oat feed, Friends',**	.....	.....	.....	.....	.....	.....	.....
Oat feed, Friends',**	7.84	5.69	8.00	2.49	3.00	.....	11 00
Oat feed, Royal,**	7.32	6.00	7.53	2.03	2.65	26.39	16 00
Oat feed, Royal,||	6.91	6.06	7.00	2.48	2.80	24.57	11 00
Oat feed, Royal,	7.22	7.38	7.30	3.65	2.80	21.69	17 00
Oat feed,‡	8.33	3.06	.....	1.22	.....	28.89	.....
Average,	7.38	5.36	.....	2.28	.....	26.28	13.64
MIXED FEEDS.							
<i>Proprietary Dairy and Stock Feeds.</i>							
Dairy feed, Quaker,	8.22	12.69	13-14	4.83	3.50	.....	23 00
Dairy feed, Quaker,	6.94	12.26	14.00	3.84	3.50	18.57	23 00
Dairy feed, Quaker,	7.03	12.81	14.00	4.01	3.50	17.51	20 00
Dairy feed, Quaker,||	7.38	11.56	14.00	3.43	3.50	18.02	23 00
Average,	7.29	12.33	.....	4.03	.....	18.03	22.25
Average digestible,††	.....	9.61	.....	3.46	.....	7.32	.....
Dairy feed, H-O Co.'s,*	10.15	17.50	18.00	2.75	4.50	.....	30 00
Dairy feed, H-O Co.'s,	9.24	17.56	18.00	4.28	4.50	.....	28 00
Dairy feed, H-O Co.'s,	7.53	18.31	18.00	5.09	4.50	12.67	28 00
Dairy feed, H-O Co.'s,	9.15	17.31	18.00	4.47	4.50	.....	28 00
Average,	9.02	17.67	.....	4.15	.....	.....	28 50
Average digestible,	.....	13.78	.....	3.56	.....	.....	.....
Dairy feed, Sucrene,	11.55	14.92	16.50	4.42	3.50	10.23	25 00
Dairy feed, Sucrene,**	13.84	11.19	16.50	2.15	3.50	8.39	23 00
Dairy feed, Sucrene,	12.17	15.19	16.50	3.28	3.50	.....	25 00
Average,	12.52	13.77	.....	3.28	.....	9.31	24 33
Dairy feed, Protana,	8.40	19.25	20.00	3.41	3.50	.....	24 00
Dairy feed, Protana,	8.37	18.50	20.00	3.65	3.50	18.62	26 00
Average,	8.38	18.87	.....	3.53	.....	.....	25 00
Dairy feed, Hammond,	15.11	15.59	17.00	5.21	3.50	9.90	26 00
Calf meal, Blatchford's,‡‡	8.89	24.25	25.00	5.07	5.00	.....	70 00
Sugar feed, Green diamond,||	9.14	11.04	16.50	2.68	3.50	13.47	21 00
Stock food, Apex,	8.42	14.69	16.00	3.83	4.07	15.03	25 00
Fattening food, Purina,§§	9.70	12.06	.....	5.49	.....	.....	.....
Molasses grains, Mueller's,	11.17	17.06	|| ||	3.88	|| ||	.....	18 00
Molasses grains, Mueller's,	15.50	19.26	***28.00	3.38	***4.00	9.66	20 00
Molasses grains, Mueller's,	19.98	14.66	|| ||	1.66	|| ||	6.92	22 00
Average of three analyses,	15.45	16.99	.....	3.14	.....	8.29	20 00
<i>Proprietary Horse Feeds.</i>							
Horse feed, H-O Co.'s,	9.19	12.69	12.00	4.42	4.50	.....	25 00
Horse feed, H-O Co.'s,	9.95	12.63	12.00	3.53	4.50	.....	28 00
Horse feed, H-O Co.'s,	9.10	12.06	12.00	5.03	4.50	10.56	27 00
Horse feed, H-O Co.'s,	8.98	11.81	12.00	4.37	4.50	10.93	28 00
Horse feed, H-O Co.'s,	8.20	11.38	12.00	4.63	4.50	10.65	27 00
Horse feed, H-O Co.'s,	8.64	11.93	12.00	4.98	4.50	10.65	28 00

††Coefficients assumed same as for H-O Dairy Feed.

‡‡A condimental preparation.

§§Illegally sold without guarantees. Price \$2.25 per cwt.

|||Improperly guaranteed: Protein and fat, 22.54 per cent.; carbohydrates, 48 per cent.

***Statement of dealers. Manufacturer's guarantee as stated in foot note |||.

TABLE VIII. ANALYSES OF SAMPLES OF FEED

Agent's number.	Name and Address of Manufacturer or Jobber.	Sampled at	Chemist's number.
34	H-O Co., The, Buffalo, N. Y.,	Altoona, H. J. White Co., Ltd.,	34
283	American Milling Co., Peoria, Ill.,	Philadelphia, P. K. Daly,	283
267	American Milling Co., Chicago, Ill.,	Lancaster, J. W. Eshleman,	267
299	American Milling Co., Owensboro, Ky.,...	Ridgway, C. O. Salberg,	299
119	American Cereal Co., The, Chicago, Ill., ..	Johnstown, J. Thomas & Sons,	119
309	H-O Co., The, Buffalo, N. Y.,	Erie, Geo. I. Seigle,	309
135	Illinois Seed Co., The, Chicago, Ill.,	Johnstown, M. J. Boyle,	135
136	Illinois Seed Co., The, Chicago, Ill.,	Johnstown, M. J. Boyle,	136
60	Foutz, S. A., Stock Food Co., Balto., Md., ..	York, F. W. Loucks & Son,	60
327	Fleck, J. J., Tiffin, O.,	Warren, Warren Mills Co.,	327
22	Aduront Mills, Bloomsburg,	Bloomsburg, J. P. Pensyl,	22
232	Detweiler, J. C., Pennsylvania,	Scottsdale, Kennell Bros.,	232
295	Emporium Milling Co., Emporium,	Emporium, C. B. Howard & Co.,	295
228	Gaddis, A., & Co., Uniontown,	Uniontown, A. Gaddis & Co.,	228
221	Long, Kell, New Haven,	New Haven, Kell Long,	221
171	Sanderson, W. H., Lock Haven,	Lock Haven, Holmes Bros.,	171
215	Toledo Grain & Milling Co., Toledo, O., ..	Connellsville, Dull & Co.,	215
323	Warren Mills Co., Warren,	Warren, Warren Mills Co.,	323
214	Whitehead, J. E., Greensburg,	Jeannette, Hess Bros.,	214
161	Fryberger, C. T., Philipsburg,	Philipsburg, C. T. Fryberger,	161
288	Royce & Coon Grain Co., The, Bowling Green, O.,	Punxsutawney, J. C. Barton,	288
312	Royce & Coon Grain Co., The, Bowling Green, O.,	Erie, P. A. Allen,	312
286	Royce & Coon Grain Co., The, Bowling Green, O.,	Punxsutawney, J. C. Barton,	286
110	Toledo Grain & Milling Co., Toledo, O., ..	Johnstown, Penn Traffic Co.,	110
123	Toledo Grain & Milling Co., Toledo, O., ..	Conemaugh, F. B. Custer,	123
302	Toledo Grain & Milling Co., Toledo, O., ..	Ridgway, John Lalson & Co.,	302
175	Gamble, Gheen & Co., Bellefonte,	Bellefonte, Gamble, Gheen & Co.,	175
126	McDermott, Wertz & Co., Johnstown, ..	Conemaugh, J. P. Farrell,	126
150	White, W. A., Milling Co., Clintondale, ..	Lock Haven, Mussina & Reed,	150
170	Toledo Grain & Milling Co., Toledo, O., ..	Lock Haven, M. L. Claster,	170
122	Toledo Grain & Milling Co., Toledo, O., ..	Conemaugh, F. B. Custer,	122
303	Toledo Grain & Milling Co., Toledo, O., ..	Ridgway, Smith Bros., Co., Ltd.,	303
294	Toledo Grain & Milling Co., Toledo, O., ..	Punxsutawney, G. A. Weiss & Bros., ..	294
95	Bare Milling Co., Roaring Spring,	Juniata, Wiet Bros.,	295
19	Blank & Gottshall, Sunbury,	Sunbury, Blank & Gottshall,	19
21	Bloomsburg Roller Mills, Bloomsburg, ..	Bloomsburg, F. P. Pursel,	21
192	Buck, D., Fleming,	Port Matilda, S. R. Pringle,	192
156	Copelin, Duke, Philipsburg,	Philipsburg, Duke Copelin,	156
184	Copelin, Duke, Philipsburg,	Philipsburg, Pa. Mercantile Co., Ltd.,	184
182	Copelin, Duke, Philipsburg,	Philipsburg, Philipsburg Produce Co.,	182
194	Cardon, F. M., Clearfield,	Clearfield, F. M. Cardon,	194
57	Dubs, S. F., Spring Forge,	York, F. Loucks & Son,	57
145	Forseman & Kelsey Co., Flemington, ..	Lock Haven, A. Simon's Sons,	145
174	Gamble, Gheen & Co., Bellefonte,	Bellefonte, Gamble, Gheen & Co.,	174
146	Knecht Bros., Parvin,	Lock Haven, Jacob Brown & Son,	146
163	Reidy, H. A., Wallaceton,	Philipsburg, L. G. Kessler Co.,	163
203	Reidy, H. A., Wallaceton,	Houtzdale, J. O'Connor,	203
189	Reidy, H. A., Wallaceton,	Morrisdale Mines, Chas. Wrye,	189
66	Strayer Bros. & Co., York,	York, Strayer Bros. & Co.,	66
180	Webber, J. H. & L. E., Centre Hall,	Osceola Mills, Michael Griffey,	180
149	White Milling Co., Clintondale,	Lock Haven, Jacob Brown & Son,	149
23	White Milling Co., Bloomsburg,	Bloomsburg, D. E. Krum,	23
24	White Milling Co., Bloomsburg,	Bloomsburg, D. E. Krum,	24
159	Wolf, Wm., Philipsburg,	Philipsburg, Wm. Wolf,	159
210	Woomer, Isaac, Graysville,	Houtzdale, G. M. Dickey,	210
307	Crouch Bros. Co., Erie,	Kane, Swanson Grocery Co.,	307
56	Husted Mill & Elevator Co., Buffalo,	York, E. E. Johnston & Co.,	56
48	Bare Milling Co., Roaring Spring,	Altoona, James Morgan,	48
44	Biddle, T. M., Altoona,	Altoona, H. H. Landon,	44
134	Boyle, M. J., Johnstown,	Johnstown, M. J. Boyle,	134
166	Claster, M. L., Lock Haven,	Lock Haven, M. L. Claster,	166
240	Toledo Elevator Co., The, Toledo, O.,	Coatesville, P. D. Handwork, Man.,	240
188	Toledo Elevator Co., The, Toledo, O.,	Morrisdale Mines, H. C. Shurgets,	188

ING STUFFS COLLECTED IN 1905.—Continued.

Name of Feed.	Moisture.	Protein.		Fat.		Crude fiber.	Price per ton.
		Found.	Guaranteed.	Found.	Guaranteed.		
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	
Horse feed, H-O Co.'s,	8.55	11.19	12.00	3.34	4.50	10.74	\$20 00
Average,	8.94	11.95	.....	4.52	.....	10.79	27 57
Average digestible, .....	.....	8.84	.....	3.62	.....	3.74	.....
Horse feed, Sucrene,*	11.92	10.68	13.50	2.43	4.50	.....	25 00
Horse feed, Sucrene,	12.47	12.59	13.50	3.21	3.50	.....	24 00
Horse feed, Sucrene,	13.32	12.37	13.50	3.29	3.50	.....	26 00
Average,	12.57	11.88	.....	2.98	.....	.....	25 00
<i>Proprietary Poultry Foods.</i>							
Poultry food, American,	9.10	12.13	14.00	6.08	4.50	5.24	36 00
Poultry feed, H-O Co.'s,	8.85	17.31	17.00	5.78	5.50	3.87	1.85 per cwt.
Chick food, Monitor,	10.54	9.88	.....	2.62	.....	.....	1.80 per cwt.
Poultry food, Phoenix,†	12.37	10.81	.....	3.08	.....	.....	0.02 per lb.
Poultry food, S. A. Foutz's,‡	9.05	9.19	.....	\$6.25	.....	.....	0.15 per lb.
Poultry powder,‡	8.47	16.69	.....	4.52	.....	14.63	0.12½ per lb.
<i>Miscellaneous Chop Feeds.</i>							
Chop,	13.24	9.10	.....	4.01	.....	2.78	27 00
Chop,	13.98	7.79	.....	3.95	.....	8.13	30 00
Chop, †|| .....	11.27	7.60	.....	4.11	.....	13.05	27 00
Chop,	12.64	8.06	5.00	3.83	3.00	8.10	23 00
Chop,	14.01	10.97	.....	3.79	.....	3.85	24 00
Chop,	12.98	8.68	.....	3.75	.....	1.52	30 00
Chop,	9.03	8.06	.....	3.27	.....	9.49	26 00
Chop,	13.80	8.41	.....	3.54	.....	5.18	24 00
Chop,	12.75	7.58	.....	3.17	.....	1.43	28 00
Chop, No. 1,	9.78	11.69	8.13	6.50	5.90	5.13	25 00
Chop, No. 1, white,	11.22	7.81	7.92	2.94	3.64	7.69	27 00
Chop, No. 1, yellow,	12.05	8.35	7.03	3.30	3.39	.....	24 00
Chop, No. 1, yellow,	10.76	7.63	7.03	2.74	3.39	9.02	27 00
Chop, No. 1, yellow,	12.90	8.32	7.03	3.27	3.39	7.25	30 00
Chop, No. 1, yellow,	12.61	7.68	.....	3.05	.....	5.76	28 00
Chop, No. 1, yellow,	12.10	7.48	8.57	3.16	3.716	6.42	30 00
Chop, fresh ground,	11.40	12.50	.....	3.69	.....	3.53	25 00
Chop, fresh ground,	10.74	8.94	.....	3.90	.....	.....	30 00
Chop, fresh ground,	10.90	9.88	.....	3.48	.....	3.42	30 00
Chop, Keystone,	9.07	9.00	9.53	3.90	5.73	8.73	26 00
Chop, Keystone,	9.47	9.50	.....	4.24	.....	7.50	27 00
Chop, C. O. B. K.,	11.39	9.14	9.53	4.25	5.73	.....	28 00
Chop, C. O. B. K.,	11.59	9.28	9.53	4.35	5.73	6.94	27 00
Chop, mixed,	9.93	11.44	8.50	5.53	4.50	4.93	30 00
Chop, mixed,	9.74	12.56	9.35	6.44	5.56	7.78	29 00
Chop, mixed,	12.90	9.25	10.06	3.58	3.90	3.80	30 00
Chop, mixed,	9.34	8.88	9.00	3.50	3.00	11.30	27 00
Chop, mixed,	10.39	8.86	7.81	6.33	5.48	8.42	24 00
Chop, mixed,**	13.53	8.42	7.81	3.24	5.48	3.90	30 00
Chop, mixed,**	13.11	8.02	7.81	3.85	5.49	7.05	25 00
Chop, mixed, No. 2,	12.80	11.38	.....	2.72	.....	9.27	25 00
Chop, mixed,	13.17	8.16	.....	3.20	.....	3.17	28 00
Chop, mixed,	12.57	10.47	.....	3.63	.....	2.77	27 00
Chop, mixed, No. 2,	11.23	12.19	.....	3.75	.....	3.59	25 00
Chop, mixed, No. 1,	13.05	10.28	.....	3.56	.....	3.23	27 00
Chop, mixed,**	17.13	10.19	7.00	1.25	5.00	8.55	28 00
Chop, mixed,	9.11	10.06	.....	4.97	.....	9.08	25 00
Chop, mixed,	9.85	9.44	.....	4.64	.....	9.02	28 00
Chop, mixed,	10.59	10.31	.....	3.16	.....	2.76	26 00
Chop, mixed, Standard,	9.47	9.19	5.62	2.80	2.88	10.36	28 00
Chop, mixed,	12.57	9.08	.....	3.67	.....	3.06	28 00
Chop, mixed,	12.68	9.46	.....	3.72	.....	4.52	30 00
Chop, mixed,	12.23	9.67	.....	3.69	.....	4.64	30 00
Chop, mixed,	8.89	11.00	11.00	5.48	4.05	4.45	26 00
Chop, mixed,	10.06	9.44	12.00	3.50	4.00	6.43	27 00
Chop feed,	13.04	9.25	.....	3.30	.....	4.89	25 00
Chop feed, Monarch,	11.63	8.31	8.09	4.41	4.16	11.84	18 00
Horse chop,	11.92	11.32	11.00	5.80	5.50	3.95	28 00
Chop, Gilt Edge C.,	15.80	8.84	8.50	2.63	3.00	2.11	28 00
Chop, Boyle's,†	10.92	10.06	.....	2.43	.....	7.17	26 00
Mixed feed,	10.40	12.13	10.44	4.21	4.11	8.04	27 00
Star feed,*	8.95	7.88	9.88	5.49	7.31	10.94	25 00
Star feed,**	16.17	10.38	9.88	1.56	7.31	9.32	28 00

*Illegally sold with incorrect guarantees.

†Illegally sold without guarantees.

‡Condimental.

\$Including sulphur.

||Adulterated with coffee hulls.

**Sample slightly musty. Portion of fat destroyed.

TABLE VIII. ANALYSES OF SAMPLES OF FEED

Agent's number.	Name and Address of Manufacturer or Jobber.	Sampled at	Chemist's number.
284	Daly, P. K., Philadelphia,	Philadelphia, P. K. Daly,	284
225	American Cereal Co., The, Chicago, Ill.,	Uniontown, M. A. Clark,	225
239	American Cereal Co., The, Chicago, Ill.,	Coatesville, P. D. Handwork, Man.,	239
36	American Cereal Co., The, Chicago, Ill.,	Altoona, L. F. Hinman & Sons,	36
61	American Cereal Co., The, Chicago, Ill.,	York, E. E. Johnston & Co.,	61
179	American Cereal Co., The, Chicago, Ill.,	Osceola Mills, McLarren Bros.,	179
333	American Cereal Co., The, Chicago, Ill.,	Pittsburg, H. Pfohl,	333
280	Great Western Cereal Co., Chicago, Ill.,	Philadelphia, H. P. Mittendorf & Co.,	280
82	Altoona Milling Co., Altoona,	Altoona, Altoona Milling Co.,	82
40	Biddle, T. M., Altoona,	Altoona, T. M. Biddle,	40
35	Biddle, T. M., Altoona,	Altoona, D. S. Ferguson,	35
16	Blank & Gottshall, Sunbury,	Sunbury, G. M. Conrad,	16
6	Brant & Co., Harrisburg,	Harrisburg, C. F. Gohl,	6
298	Catlin, C. G., Emporium,	Emporium, C. G. Catlin,	298
262	Crisman, J. E., Windber,	Windber, J. E. Crisman,	262
193	Cardon, F. M., Clearfield,	Clearfield, F. M. Cardon,	193
141	Forseman & Kelsey, Flemington,	Lock Haven, Scott Bros.,	141
106	Fouse Bros., Bellwood,	Bellwood, L. W. Irwin & Co.,	106
247	Gay, J. T., & Son, Coatesville,	Coatesville, J. T. Gay & Son,	247
49	Grazier, C., Warriorsmark,	Warriorsmark, J. R. Lehman,	49
11	Gross, E. B., Harrisburg,	Harrisburg, E. B. Gross,	11
116	Johnstown Dry Grains Co., Johnstown, ..	Johnstown, Johnstown Dry Grains Co.,	116
329	Keil & Thorn, Pittsburg,	Pittsburg, G. W. Keil & Co.,	329
231	Kiester, Albert, Scottdale,	Scottdale, J. O. Landenberger,	231
78	Klepser Bros., Martinsburg,	Altoona, Klepser Bros.,	78
102	Mentzer, F. & T., Frankstown,	Altoona, F. E. Mitchell & Co.,	102
98	Mentzer, F. & T., Frankstown,	Altoona, S. T. Moffit,	98
273	Nein & Fisher, Lancaster,	Lancaster, Nein & Fisher,	273
259	Northern Milling Co., Lockport, Ill.,	South Fork, A. D. Strong,	259
251	Philips, E. Vinton, Downingtown,	Downingtown, E. Vinton Philips,	251
1	Schomaker, Wm., & Co., Greensburg, ..	Greensburg, Wm. Schomaker & Co.,	1
212	Sloan, W. S., Jeannette,	Jeannette, W. S. Sloan,	212
76	Spanogle & Yeager, Lewistown,	Altoona, J. P. Long,	76
32	Spanogle & Yeager, Lewistown,	Altoona, Spanogle & Yeager,	32
17	Swab, M. L., Sunbury,	Sunbury, G. M. Conrad,	17
129	Swope Bros., Johnstown,	Johnstown, S. Gearhart,	129
200	Unknown,	Houtzdale, Eureka Supply Co.,	200
305	H-O Co., The, Buffalo, N. Y.,†	Kane, Dolan Bros.,	305
316	American Cereal Co., Chicago, Ill.,	Erie, W. J. Carroll,	316
229	American Cereal Co., Chicago, Ill.,	Scottdale, Campbell & Hepler,	229
224	American Cereal Co., Chicago, Ill.,	Uniontown, M. A. Clark,	224
216	American Cereal Co., Chicago, Ill.,	Connellsville, Dull & Co.,	216
93	American Cereal Co., Chicago, Ill.,	Juniata, Hoover Merchandise Co.,	93
46	American Cereal Co., Chicago, Ill.,	Altoona, James Morgan,	46
9	American Cereal Co., Chicago, Ill.,	Harrisburg, I. L. Nailor,	9
2	American Cereal Co., Chicago, Ill.,	Greensburg, J. W. Pollins Co.,	2
13	American Cereal Co., Chicago, Ill.,	Huntingdon, Stauffer & Brenaman,	13
306	American Cereal Co., Chicago, Ill.,	Kane, Swanson Grocery Co.,	306
31	American Cereal Co., Chicago, Ill.,	Johnstown, J. Thomas & Sons,	31
241	American Cereal Co., Chicago, Ill.,	Coatesville, P. D. Handwork, Man.,	241
37	American Cereal Co., Chicago, Ill.,	Altoona, L. F. Hinman & Sons,	37
51	American Cereal Co., Chicago, Ill.,	Tyrone, W. C. Kanode,	51
42	American Cereal Co., Chicago, Ill.,	Altoona, H. H. Landon,	42
308	American Cereal Co., Chicago, Ill.,	Erie, Geo. L. Seigle,	308
289	American Cereal Co., Chicago, Ill.,	Punxsutawney, T. C. Zeitler,	289
176	Dryer, F. I., & Co., Curwensville,	Osceola Mills, Brown, Baird & Reeves,	176
209	Houtzdale Grist Mill Co., Houtzdale, ...	Houtzdale, Houtzdale Grist Mill Co.,	209
115	Johnstown Dry Grains Co., Johnstown, ...	Johnstown, Johnstown Dry Grains Co.,	115
260	Northern Milling Co., Lockport, Ill., ...	South Fork, A. D. Strong,	260

*Illegally sold without guarantees.

†Illegally sold with incorrect guarantees.

‡Illegally sold with incorrect guarantee for protein.

§Coefficients assumed the same as for Victor corn and oat feed.

||Sample slightly musty. Portion of fat destroyed.

ING STUFFS COLLECTED IN 1905.—Continued.

Name of Feed.	Moisture.	Protein.		Fat.		Crude fiber.	Price per ton.
		Found.	Guaranteed.	Found.	Guaranteed.		
Soft feed, "hay, bran and corn chop,"*	Per ct. 10.35	Per ct. 10.56	Per ct.	Per ct. 4.78	Per ct.	Per ct. 7.63	\$26.00
Average,	11.73	9.47	.....	3.81	.....	6.19	26.81
<i>Corn and Oat Feeds.</i>							
Corn and oat feed, Victor,	8.08	8.81	9.00	4.57	4.00	.....	24.00
Corn and oat feed, Victor,	9.44	9.44	9.00	4.23	4.00	.....	23.00
Corn and oat feed, Victor,	8.14	8.25	9.00	3.87	4.00	12.76	28.00
Corn and oat feed, Victor,†	8.89	6.38	9.00	2.35	4.00	14.18	18.00
Corn and oat feed, Victor,	9.25	8.00	9.00	3.86	4.00	13.27	28.00
Corn and oat feed, Victor,†	8.82	7.25	9.00	3.52	4.00	.....	22.00
Average,	8.77	8.02	.....	3.73	.....	13.40	23.83
Average digestible, .....	.....	5.69	.....	3.24	.....	6.43	.....
Corn and oat feed, Boss,‡	8.47	7.50	9.00	4.44	4.00	12.27	24.00
Digestible,§	.....	5.32	.....	3.86	.....	5.88	.....
<i>Corn and Oats Chop</i>							
Corn and oats chop,*	10.05	9.02	.....	5.61	.....	10.47	26.00
Corn and oats chop, Star,	9.48	10.31	8.50	3.75	3.00	8.32	26.00
Corn and oats chop, Star,	13.15	8.16	8.50	2.80	3.00	7.47	28.00
Corn and oats chop,	11.74	9.50	.....	4.31	.....	4.04	30.00
Corn and oats chop,	13.86	8.72	.....	2.6	.....	3.59	28.00
Corn and oats chop,	13.94	9.39	.....	3.13	.....	4.36	27.00
Corn and oats chop,	13.66	9.38	.....	4.05	.....	4.41	26.00
Corn and oats chop,||	13.59	7.81	.....	1.93	.....	5.79	27.00
Corn and oats chop,	13.47	11.22	.....	3.73	.....	3.15	28.00
Corn and oats chop,	14.00	9.04	.....	3.96	.....	3.09	29.00
Corn and oats chop,	14.39	9.45	.....	4.28	.....	3.93	28.00
Corn and oats chop,	13.75	9.68	9.00	2.95	3.00	3.08	30.00
Corn and oats chop,	14.02	9.38	.....	3.82	.....	2.30	23.00
Corn and oats chop,	10.76	9.44	.....	4.07	.....	3.77	26.00
Corn and oats chop,	11.63	10.16	.....	3.67	.....	4.72	25.00
Corn and oats chop,	14.44	8.38	.....	3.53	.....	3.14	30.00
Corn and oats chop,	12.61	9.91	7.00	3.26	3.00	4.02	26.00
Corn and oats chop,	13.05	8.82	7.00	1.52	3.00	5.86	28.00
Corn and oats chop,	11.64	10.28	7.00	3.23	3.00	5.94	28.00
Corn and oats chop,	13.17	9.55	.....	4.70	.....	4.88	20.89
Corn and oats chop,*	11.02	7.61	.....	2.55	.....	14.94	28.00
Corn and oats chop,	12.80	8.27	.....	3.08	.....	6.31	27.00
Corn and oats chop,**	.....	.....	.....	.....	.....	.....	22.00
Corn and oats chop,	13.60	9.21	.....	3.89	.....	3.47	27.00
Corn and oats chop,	12.73	9.92	.....	3.34	.....	4.43	27.00
Corn and oats chop, Dairy,†	12.56	9.25	11.00	3.26	4.00	5.95	25.00
Corn and oats chop,	10.22	8.98	.....	4.00	.....	3.28	30.00
Corn and oats chop, pure,	13.19	8.95	.....	3.47	.....	3.55	30.00
Corn and oats chop,	15.67	8.27	.....	3.42	.....	2.31	27.00
Corn and oats chop,††	13.75	9.03	.....	3.16	.....	4.17	28.00
Average,§§	12.89	9.27	.....	3.55	.....	4.67	27.93
Average digestible,§	.....	6.60	.....	3.08	.....	2.24	.....
<i>Corn, Oats and Barley.</i>							
Corn, oats and barley,	8.55	10.44	12-13	4.01	5.00	.....	25.00
Corn, oats and barley,	8.45	10.31	12-13	4.55	5.00	.....	28.00
Corn, oats and barley,	8.44	10.94	12-13	4.53	5.00	.....	25.00
Corn, oats and barley,	8.43	10.88	12-13	4.60	5.00	.....	26.00
Corn, oats and barley,†	9.60	9.94	13.00	3.69	5.00	11.00	31.00
Corn, oats and barley,†	8.54	9.63	13.00	3.74	5.00	10.64	30.00
Corn, oats and barley,†	8.76	10.13	13.00	3.81	5.00	11.60	25.00
Corn, oats and barley,†	8.26	9.88	13.00	4.02	5.00	11.41	24.00
Corn, oats and barley,†	9.02	9.19	13.00	3.95	5.00	11.84	29.00
Corn, oats and barley,	8.95	10.31	12-13	4.43	5.00	11.39	23.00
Corn, oats and barley,†	8.57	9.69	13.00	4.03	5.00	11.98	27.00
Schumacker's stock feed,	9.53	10.25	12-13	4.45	5.00	.....	27.00
Schumacker's stock feed,†	7.99	9.75	13.00	4.08	5.00	11.60	28.00
Schumacker's stock feed,†	8.80	9.63	13.00	3.81	5.00	11.54	28.00
Schumacker's stock feed,†	7.91	9.75	13.00	4.10	5.00	12.47	28.00
Schumacker's stock feed,	8.53	10.69	13.00	4.66	5.00	.....	24.00
Schumacker's stock feed,	8.05	10.69	12-13	5.81	5.00	.....	26.00
Average,	8.61	10.12	.....	4.25	.....	11.55	25.71
Corn, oats and barley,||	13.60	8.88	.....	1.53	.....	2.58	30.00
Corn, oats and barley,	13.79	8.53	.....	3.48	.....	2.31	26.00
Corn, oats and barley,	10.51	10.00	.....	3.77	.....	5.65	27.00
Corn, oats and barley,*	8.62	10.31	.....	3.28	.....	13.97	30.00

**Sample moldy when received.

††Statement of dealers.

‡‡Statement of dealers: H-O Co.'s Horse Feed.

§§Excluding No. 259.

TABLE VIII. ANALYSES OF SAMPLES OF FEED

Agent's number.	Name and Address of Manufacturer or Jobber.	Sampled at	Chemist's number.
28	Reitz & Good, Johnstown,	Johnstown, Reitz & Good,	28
53	Dubs, S. F., Spring Forge,	York, Eyster & Rauhauser,	53
65	Dubs, S. F., Spring Forge,	York, J. W. Royer,	65
142	Furst Bros., Cedar Spring,	Lock Haven, Scott Bros.,	142
336	Stewart, D. G., & Giedel, Pittsburg, ...	Pittsburg, F. S. Morgan,	336
160	Wolf, Wm., Philipsburg,	Philipsburg, Wm. Wolf,	160
50	Grazier, C., Warriorsmark,	Warriorsmark, F. K. Mattern,	50
52	Grazier, C., Warriorsmark,	Tyrone, Templeton & Co.,	52
41	Biddle, T. M., Altoona,	Altoona, T. M. Biddle,	41
88	Klepser Bros., Martinsburg,	Altoona, H. R. Earlenbaugh,	88
77	Klepser Bros., Martinsburg,	Altoona, Klepser Bros.,	77
101	Mentzer, F. & T., Frankstown,	Altoona, F. E. Mitchell & Co.,	101
99	Mentzer, F. & T., Frankstown,	Altoona, S. T. Moffit,	99
43	Spanogle & Yeager, Lewistown,	Altoona, H. H. Landon,	43
33	Spanogle & Yeager, Lewistown,	Altoona, Spanogle & Yeager,	33
83	Poet, P. W., Altoona,	Altoona, P. W. Poet,	83
39	Pioneer Cereal Co., Akron, O.,	Altoona, P. W. Poet,	39
152	Pioneer Cereal Co., Akron, O.,	Lock Haven, E. E. Wentz,	152
199	Norton Milling Co., Chicago, Ill.,	Clearfield, J. W. Eberts & Co.,	199
72	Star & Crescent Milling Co., Chicago, Ill.,	Altoona, C. Hauser & Son,	72
26	Alma Sugar Co., Alma, Mich.,	Johnstown, Reitz & Good,	26
25	Rock Co. Sugar Co., Janesville, Wis., ...	Johnstown, Reitz & Good,	25

ING STUFFS COLLECTED IN 1905.—Continued.

Name of Feed.	Moisture.	Protein.		Fat.		Crude fiber.	Price per ton.
		Found.	Guaranteed.	Found.	Guaranteed.		
Corn, oats and barley,	Per ct. 16.83	Per ct. 9.21	.....	Per ct. 2.07	.....	Per ct. 3.32	\$25.00
Average,*	13.68	9.15	.....	2.71	.....	3.46	27 00
<i>Corn, Oats and Rye.</i>							
Corn, oats and rye chop,	9.39	9.63	.....	3.72	.....	3.21	29 00
Corn, oats and rye chop,	11.56	8.74	.....	3.80	.....	2.86	29 00
Corn, oats and rye chop,	11.04	11.99	.....	3.55	.....	3.07	30 00
Corn, oats and rye chop,	10.57	11.00	.....	3.54	.....	5.89	25 00
Corn, oats and rye chop,	8.90	11.31	11.00	5.59	4.06	4.59	28 00
Average,	10.29	10.53	.....	4.04	.....	3.92	28 20
<i>Corn, Oats and Wheat.</i>							
Corn, oats and wheat chop,	9.75	9.75	9.00	3.32	3.00	3.68	30 00
Corn, oats and wheat chop,	12.19	9.53	9.00	3.14	3.00	2.82	29 00
Average,	10.97	9.64	.....	3.23	.....	2.95	29 50
<i>Oats and Rye.</i>							
Oats and rye chop, Standard,	8.24	11.44	9.50	3.92	1.40	8.60	25 00
Oats and rye chop,	10.72	11.44	7.00	3.51	3.00	5.32	31 00
Oats and rye chop,	8.73	11.38	7.00	4.28	3.00	7.00	26 00
Oats and rye chop,	10.65	12.69	7.00	3.18	3.00	5.19	26 00
Oats and rye chop,	9.45	12.25	7.00	3.11	3.00	5.63	28 00
Oats and rye chop,	9.63	12.50	.....	2.34	.....	4.08	28 00
Oats and rye chop,	10.09	11.50	11.00	3.71	3.70	3.96	25 00
Average,	9.64	11.89	.....	3.43	.....	5.68	27 00
<i>Oats, Barley and Rye.</i>							
Oats, barley and rye chop,	9.07	12.28	.....	3.07	.....	10.10	27 00
UNCLASSIFIED FEEDS.							
<i>Barley Products.</i>							
Barley, pure,	8.23	13.69	13.00	4.07	4.00	10.84	25 00
Barley, pure, Pioneer,	9.46	13.56	15.00	3.92	4.61	11.61	26 00
Average,	8.85	13.63	.....	4.00	.....	11.23	25 50
Barley feed,†	8.75	11.00	.....	4.29	.....	14.63	25 00
Barley feed,†	10.13	12.94	.....	3.81	.....	12.24	26 00
Average,	9.44	11.97	.....	4.05	.....	13.43	25 50
<i>Sugar Beet Residue.</i>							
Beet pulp, dried,	8.89	8.38	8.50	0.76	0.59	19.18	23 00
Beet pulp, dried,	7.53	10.50	8.50	0.72	0.59	13.96	23 00
Average,	8.21	9.44	.....	0.74	.....	16.67	23 00

*Excluding No. 260.

†Illegally sold without guarantees.

